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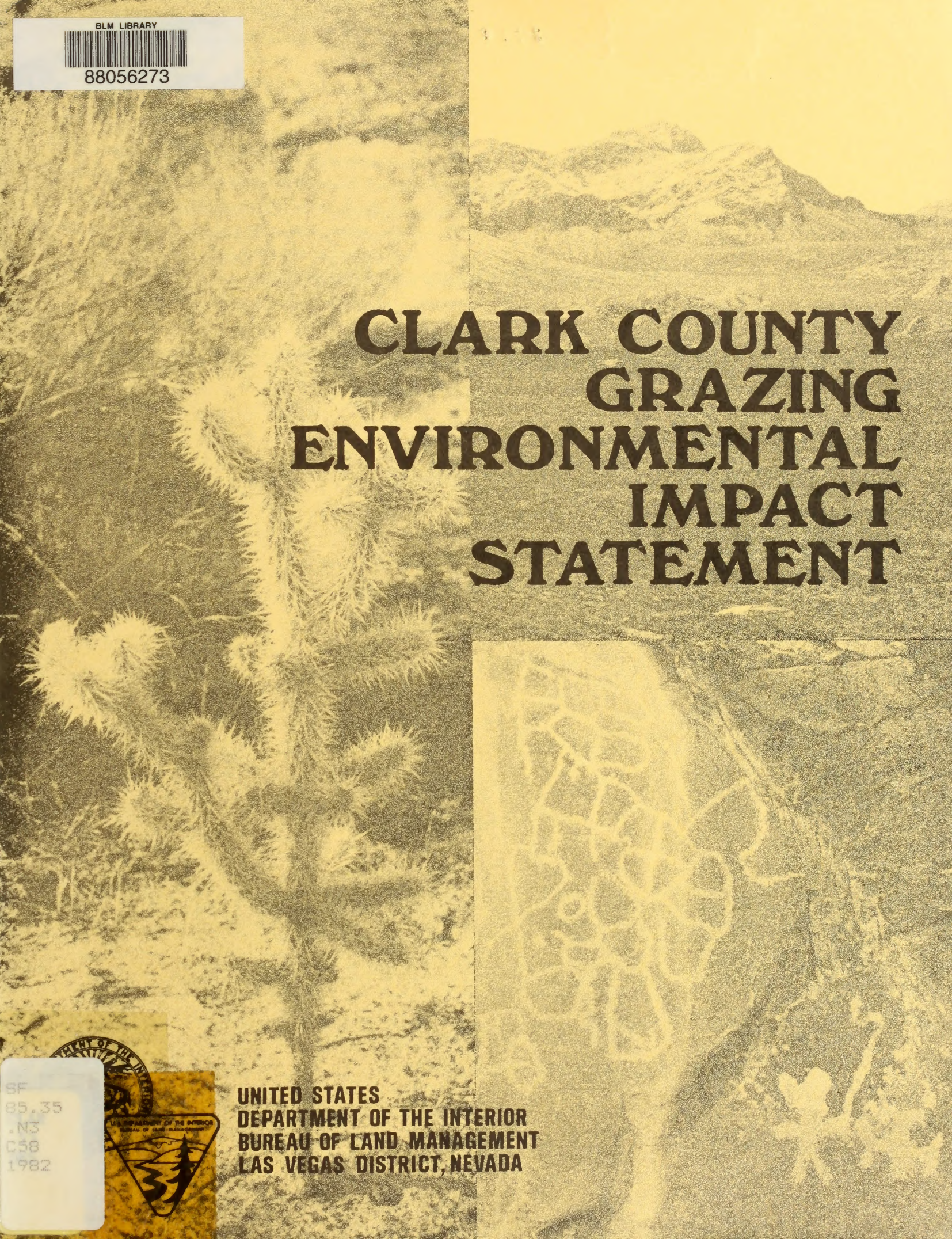

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAS VEGAS DISTRICT, NEVADA

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ENVIRONMENTAL IMPACT STATEMENT

PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM

for

CLARK COUNTY

Nevada

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Prepared by

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

LAS VEGAS DISTRICT

Edward F. Spang

State Director

Nevada State Office

The Bureau of Land Management proposes to implement a livestock grazing management program for Clark County in the Las Vegas District in southern Nevada. This program proposes to determine the levels of rangeland management intensity, evaluate the existing ephemeral range classification, identify alternative methods of protection of crucial resource areas, and list the standard procedures for operation. Four alternatives are considered along with the Proposed Action. They are: No Livestock Grazing, No Action, Livestock Production, and Natural Resource Protection. A discussion of the affected environment is briefly summarized and the environmental consequences occurring from the Proposed Action and each alternative are documented in the EIS.

For Further Information Write Kemp Conn, District Manager, P.O. Box 26569, 4765 West Vegas Drive, Las Vegas, Nevada 89126 or call 702-385-6403

Date by which comments are due: AUG 13 1982

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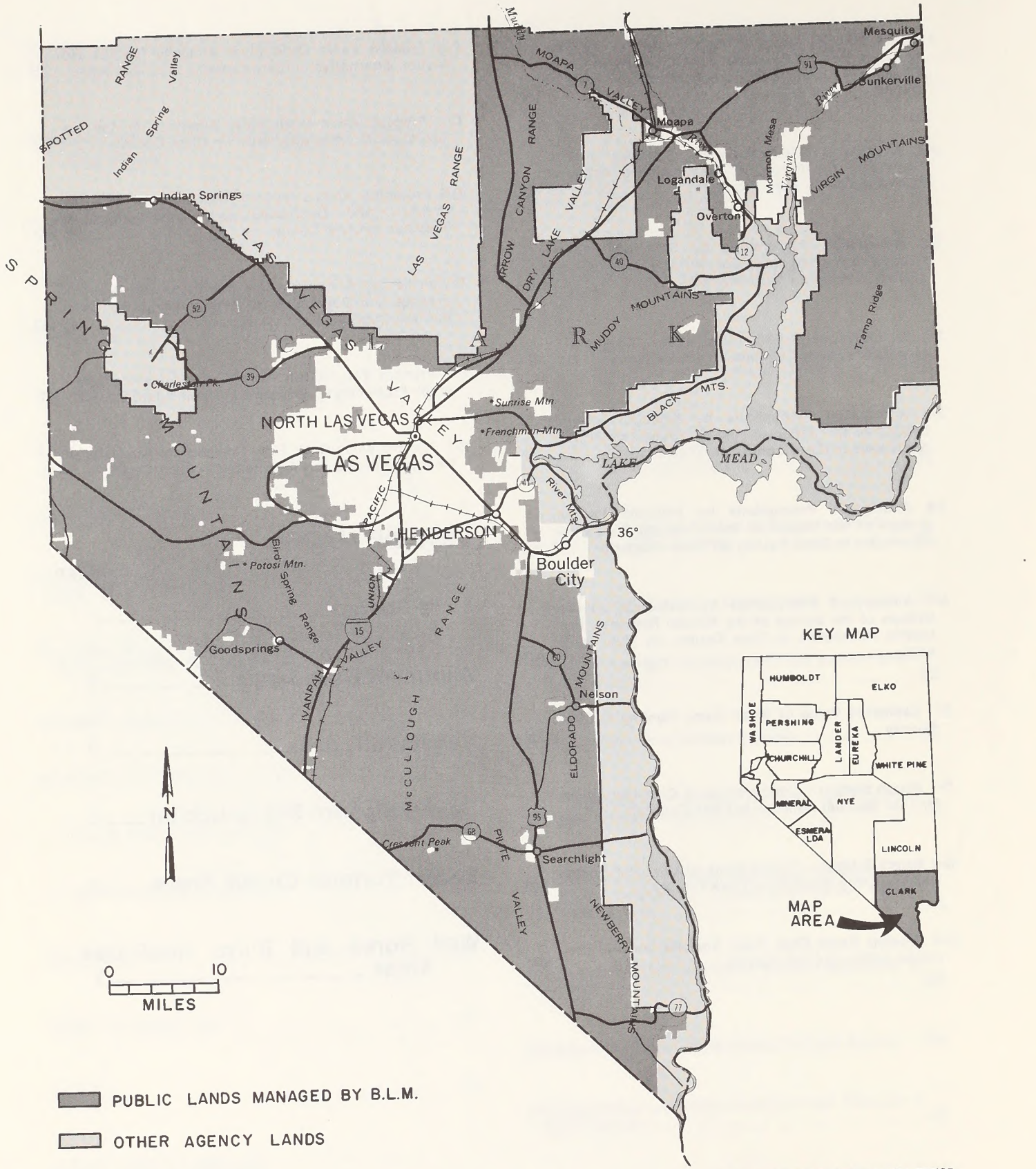


UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT

LAND STATUS

1982

SUMMARY

THE SETTING

The Las Vegas District, Bureau of Land Management (BLM), is evaluating its range management program for public lands in Clark County, Nevada. The medium of evaluation is the BLM's land use planning system. A management framework plan (MFP) is being prepared. Certain MFP Step 2 recommendations regarding range management are the focus of this environmental impact statement.

The area under consideration is in southern Nevada, largely in the Mojave Desert Biome. It covers 3,610,769 acres of public land administered by the Bureau of Land Management. The total acreage within Clark County amounts to some 5.1 million.

Since December 7, 1968, all of the grazed public lands have been administered under a Special Rule for Ephemeral Range, promulgated in that year by BLM and simultaneously applied to the Las Vegas District. Essentially, this rule allows the BLM to authorize livestock grazing only when precipitation is such that annual forage plants would be produced. The grazing emphasis would be on those ephemeral plants.

THE PROGRAM

As a result of the planning evaluation, the District proposed a program which would retain the ephemeral grazing classification on some allotments and reclassify others from ephemeral to ephemeral-perennial grazing. The latter category recognizes the existence of (or potential for) a perennial grazing base which can be used for, and improved by, livestock grazing. The program also proposed different levels of management (maintenance, intensive, custodial) based on that potential for improvement. Other proposals involved management direction for wild horses and burros, and for wildlife species, particularly bighorn sheep, desert tortoise, and small game.

THE ANALYSIS

In addition to the Proposed Action, outlined above, the EIS examined four alternatives: No Action, No Livestock Grazing, Livestock Production, and Natural Resource Protection. Components of each of the five courses of action are summarized in Summary Table One and include: a range classification by allotment; a setting of wildlife habitat management goals; a setting of wild horse and burro herd use areas and numbers goals; and a proposal and estimated cost for management facilities.

The environmental impacts of the five courses of action, as discussed in Chapter Three, are shown in comparative form in Summary Table Two. These impacts are identified as to their significance (based on thresholds described in Chapter Three) and whether they are beneficial or adverse to the impacted resource or interest. In some cases, it cannot be determined if an impact would exceed a threshold, in which case only the beneficiality or adversity of the impact is identified.

AREAS OF CONTROVERSY

Public contacts have been made with interest groups, local and state governments, other federal agencies, and numerous individuals to determine the areas of concern with the proposed grazing management program for Clark County public lands.

The main area of controversy involved the initial settings of livestock, wild burro, and bighorn sheep use based on completed range inventory information. Because of the long history of use of perennial forage under ephemeral management guidelines and the climatic extreme in southern Nevada, it was felt that the range survey production data may not be indicative of true carrying capacity of appropriately managed perennial forage, so the range survey production data was not used to set stocking levels and periods-of-use (see Appendix F).

Some data from the range survey was used to aid in recommending reclassifications and in this analysis (see Appendices A and F).

Actual reclassifications and future adjustments in use would be made over a five-year period, using a combination of monitoring information and inventory data, and would begin immediately following completion of the EIS. Adjustments in use would first begin within those allotments which were to be reclassified and where studies and inventory information indicate excessive utilization above carrying capacity.

THE PREFERRED ALTERNATIVE

The Proposed Action is the Bureau of Land Management's Preferred Alternative. Overall, the Proposed Action would provide for improvement in the conditions of all natural resources, within a multiple-use context. Specifically, the Proposed Action accomplishes the following:

* It would result in a significant improvement of the vegetation resource on the public rangelands in Clark County.

* The Proposed Action would result in sufficient habitat improvement so as to allow bighorn sheep populations in current habitat to reach reasonable numbers in the long term or shortly thereafter. That would lead to increased hunting and recreational opportunities.

* This alternative would, in the long term, provide adequate spring forage to desert tortoise, affording females a better opportunity to recover from the stresses of egg-laying. That should improve the male-female ratio in the population and result in a long-term improvement in the viability of those populations.

* On 29 of 34 currently grazed allotments in Clark County, there would be either improvement or maintenance of the status quo in the present livestock operations. On 18 of the 29, intensive or maintenance management, establishment of perennial grazing preference, and properly regulated ephemeral grazing would stabilize the livestock operations and provide a sustained yield of livestock forage. Offsetting that, to a degree, would be the potential for elimination of current livestock operations on five ephemeral/custodial allotments. In all five situations, however, the ephemeral forage resource would remain available to entrepreneurs able to make profitable use of it.

* The Proposed Action would create profitable opportunities for 11 more persons to work as guides for bighorn sheep hunters.

* The Proposed Action produces an acceptable return to the public for each public dollar invested; cost-to-benefit ratio is 1.12 to 1.

SUMMARY TABLE ONE

ANALYSIS COMPONENTS OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

Components	Alternatives				
	Proposed Action	No Action	No Livestock Grazing	Livestock Production	Natural Resource Protection
Short-Term Management Actions	Of the 49 allotments, 18 would be reclassified EP, 16 would remain classified E, and 15 would remain ungrazed.	All 49 allotments would remain classified ephemeral; 7 allotments which are allotted but ungrazed could be grazed in the future; 8 allotments would remain ungrazed.	All domestic livestock grazing would be eliminated.	Of the 49 allotments, 18 would be reclassified EP, 16 would remain classified E, and the 15 currently ungrazed allotments would be classified E and made available for grazing.	The 49 allotments would be classified as for the Proposed Action; in addition, domestic sheep grazing would be eliminated from the Bunkerville and Christmas Tree Pass allotments to resolve a conflict with bighorn sheep.
	18 EP allotments, 1 E allotment, and 1 ungrazed allotment would be managed in the Improve category; 15 E allotments would be managed in the Custodial category; and 14 allotments would continue in an ungrazed category.	No designation of selective management categories for livestock grazing allotments would be made.	No designation of selective management categories for livestock grazing allotments would be made.	Management intensity would be designated as under the Proposed Action.	Management intensity would be designated as under the Proposed Action.
	Monitoring would be done on the 16 Nevada-administered EP allotments to help determine livestock base herd levels and periods-of-use.	No monitoring of perennial forage would be done.	Monitoring would be accomplished county-wide to assure that range carrying capacities were not being exceeded by wildlife or wild horses and burros.	Monitoring would be done as under the Proposed Action.	Monitoring of all grazing animals would be accomplished to make adjustments leading to sustained-yield utilization levels.
	Initial livestock stocking level on the 16 Nevada-administered EP allotments would be a five-year-average of 24,158 AUMs.	No livestock stocking levels are set on ephemeral range.	No livestock would be grazed.	Initial livestock stocking level on the 16 Nevada-administered EP allotments would be 28,989 AUMs, 20% greater than the past five-year-average.	Initial livestock stocking level on the 16 Nevada-administered EP allotments would be 19,327 AUMs, or 20 % less than the past five-year-average.
	Ephemeral use would be authorized only after strict inspection of ephemeral forage production, with consideration given to other resource needs.	Ephemeral forage would not necessarily be field-evaluated prior to licensing ephemeral use.	No ephemeral use by domestic livestock would be authorized.	Ephemeral use would be authorized on all 47 Nevada-administered allotments without field inspections or consideration of other resource values.	Ephemeral use would be authorized only after strict inspection of ephemeral forage production and reservation of a certain amount of forage for desert tortoise.
	Wild horses and burros would initially be managed at current levels in existing herd use areas. Desirable numbers would be determined through monitoring and CRMP, and maintained in present habitat.	Wild horses and burros would continue to be managed at current levels in existing herd use areas.	98 burros would be removed from Gold Butte and relocated to the Muddy Mountains (83) and Eldorado area (15); wild horses and burros in the Spring Mountains would be allowed to increase by 20%.	Burro herds in the Gold Butte, Muddy Mountain, and Eldorado herd use areas would be reduced by half (180 animals); wild horses and burros in the Spring Mountains would be managed at current numbers.	Wild horses and burros would be managed at current levels in existing herd use areas, except in Gold Butte where 250 burros would be removed.
	Bighorn sheep habitat would initially be managed to support current populations in existing habitat. Management goal would be to provide for reasonable numbers in current habitat.	Wildlife habitat would be managed to satisfy the requirements of current numbers in existing locations; expansion would not be opposed.	The wildlife habitat management goal would be to satisfy the requirements of reasonable numbers in current and historic habitat; reintroductions would be made.	Current numbers of bighorn sheep would be maintained in existing habitat except in the Bunkerville and Christmas Tree Pass allotments, where bighorn would be removed to resolve conflicts with domestic sheep.	A certain amount of ephemeral forage, to be determined through the CRMP process, would be reserved for desert tortoise.

SUMMARY TABLE ONE (continued)

ANALYSIS COMPONENTS OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

Components	Alternatives				
	Proposed Action	No Action	No Livestock Grazing	Livestock Production	Natural Resource Protection
	Developments would be constructed to protect 18 riparian areas and 15 bighorn waters.	No major wildlife-related projects would be initiated.	40 wildlife guzzlers would be constructed to expand bighorn habitat; two riparian areas would be protected from burro use.	41 wildlife guzzlers would be constructed in current bighorn habitat.	Riparian and bighorn wildlife developments would be constructed as under the Proposed Action.
	On the 16 Nevada-administered EP allotments, AMPs would be developed on 7 allotments, an existing AMP would be revised, and grazing systems would be implemented on 8 allotments.	No AMPs would be developed or implemented.	No AMPs would be developed or implemented.	AMPs and grazing systems would be developed and implemented as under the Proposed Action.	AMPs and grazing systems would be developed and implemented as under the Proposed Action.
	Range improvements would be developed to improve livestock distribution and forage utilization: 7 mi pipeline, 6 troughs, 6 mi fence, 1 water tank.	No major livestock-related range improvements would be developed; most range improvement funding would be devoted to maintenance of existing projects.	No livestock-related range improvements would be developed or implemented.	Range improvements would be developed to improve livestock distribution and forage utilization: 4.5 mi pipeline, 5 troughs, 1 water tank.	Range improvements would be developed to improve livestock distribution: 7.3 mi pipeline, 6 troughs, 1 water tank.
Long Term	Resolution of problems would result in 17 EP allotments managed in the I category, 1 EP allotment in the M category, 16 E allotments in the C category, and 15 allotments would remain ungrazed.	Actions described for the short term would continue.	Actions described for the short term would continue.	Management intensity would evolve as under the Proposed Action.	Management intensity would evolve as under the Proposed Action.
	Monitoring of the 16 Nevada-administered EP allotments would continue to assist in adjusting grazing numbers.	Monitoring of the 16 Nevada-administered EP allotments would continue to assist in adjusting grazing numbers.	Monitoring of the 16 Nevada-administered EP allotments would continue to assist in adjusting grazing numbers.	Monitoring of the 16 Nevada-administered EP allotments would continue to assist in adjusting grazing numbers.	Monitoring of the 16 Nevada-administered EP allotments would continue to assist in adjusting grazing numbers.
	Additional range improvements would be developed on the 1 allotments to improve livestock distribution and expand accessibility to perennial forage.			Additional range improvements would be developed on the 1 allotments to improve livestock distribution and expand accessibility to perennial forage.	
	Bighorn HMP projects would be developed to resolve livestock-bighorn conflicts and to help bighorn achieve reasonable numbers.			Additional bighorn guzzlers would be developed to offset increased livestock use of natural springs and waters.	Bighorn HMP projects would be developed and reintroductions into historic habitat would be made.
Cost	Short Term - $ 287,000 Long Term - $1,140,000 Total - $1,427,000	Short Term - $ 83,000 Long Term - $340,000 Total - $423,000	Short Term - $210,000 Long Term - $700,000 Total - $910,000	Short Term - $ 290,000 Long Term - $1,140,000 Total - $1,430,000	Short Term - $ 294,000 Long Term - $1,140,000 Total - $1,434,000

Abbreviations:

E - Ephemeral
EP - Ephemeral-Perennial
I - Intensive
C - Custodial
M - Maintenance
AMP - Allotment Management Plan
HMP - Habitat Management Plan

Source: Clark County EIS Team 1982.

SUMMARY TABLE TWO

COMPARATIVE SUMMARY OF BENEFICIAL AND UNAVOIDABLE ADVERSE IMPACTS

Environmental Elements	Alternatives				
	Proposed Action	No Action	No Livestock Grazing	Livestock Production	Naturnl Resource Protection
Vegetation					
Short Term	Vegetation in the major desert wash areas would improve - BI Riparian vegetation around the 18 protected springs would improve - BI	Riparian and desert wash vegetation would continue to deteriorate - SAI	Riparian nnd desert wash vegetation would recover and improve - SBI	Vegetntion in major desert washes would improve - BI Riparian vegetation would continue to deteriorate - AI	Vegetation in the major desert washes would improve - BI Riparian vegetation around the 18 springs would improve - BI
Long Term	Vegetation on the 15 ungrazed allotments would move toward ecological climax condition. Livestock forage condition on 15 EP/1 allotments would improve on 9% of acreage - SBI The vegetation community in the Gold Butte area would stabilize and plant diversity would increase - BI	There would be continued loss of perennial grasses and shrubs - AI The deterioration of the vegetation community in Gold Butte would slow or stop.	Livestock forage condition would improve by 10% - SBI Vegetation would move toward ecological climax condition. Vegetation in the Gold Butte nrea would improve as under the Proposed Action, but at a slower rate - BI	Livestock forage condition would improve ns under the Proposed Action, but at a slower rate - SBI Impncts to vegetation in the Gold Butte area would be the sume as under the Proposed Action - BI	Livestock forage condition would improve as under the Proposed Action, but nt a faster rate - SBI
Wildlife					
Short Term	Conflicts at 15 bighorn sheep waters would be resolved - BI Conflicts on 239,000 acres of crucial desert tortoise habitat would be reduced - BI Conflicts would continue on 247,200 acres of crucial tortoise habitat - AI 777,400 acres of crucial quail habitat would improve - BI Riparian and desert wash habitat would improve - BI	Wildlife habitat in riparian and desert wash areas would continue to deteriorate - AI	Wildlife habitat in riparian and desert wash areas would improve - BI	Bighorn conflicts with livestock would increase and new conflicts would be created with licensing in previously ungrazed allotments - AI Quail populations would decrease - AI Wildlife habitat in riparian and desert wash areas would deteriorate rapidly - AI Conflicts would be created for the limited elk population in the Spring Mountains - AI	Impacts to wildlife would be the same as under the Proposed Action, with more intensity of short-term benefits because of initial decrease in livestock conflicts - BI
Long Term	Current bighorn habitat would be improved and populations would approach reasonable numbers - SBI Increased perennial forage would benefit desert tortoise - BI	All wildlife populations may decline, the tortoise possibly to nonviable levels - AI	Both current and historic bighorn habitat would improve so as to support reasonable numbers - SBI Increased perennial forage would result in better survival and reproduction of desert tortoise - SBI Average quail populations may approach wet-year levels - BI	Bighorn populations in the Virgin Mountains and Newberry Mountains would be decimated - SAI Tortoise populations would decline - SAI	Tortoise population viability would be assured by ephemeral forage reservations - BI

SUMMARY TABLE TWO (continued)

COMPARATIVE SUMMARY OF BENEFICIAL AND UNAVOIDABLE ADVERSE IMPACTS

Environmental Elements	Alternatives				
	Proposed Action	No Action	No Livestock Grazing	Livestock Production	Natural Resource Protection
Wild Horses and Burros					
Short Term	Removal of animals could result in a death loss of 0-3% of removed animals. The remaining herds could experience improved reproduction rates - BI		Impacts of removal would be the same as under the Proposed Action. Conflicts with livestock would be reduced - BI	Impacts of removal would be the same as the Proposed Action. Conflicts with livestock may be created by licensing use on previously ungrazed allotments - AI	Impacts of removal would be the same as under the Proposed Action. Conflicts with livestock would be reduced - BI
Long Term	Additional range improvements may change the size of current herd use areas - AI	The Gold Butte herd may exceed the carrying capacity of its range and crash - AI		Additional range improvements may change the size of current herd use areas - AI	Additional range improvements may change the size of current herd use areas - AI
Livestock Grazing					
Short Term	Strict ephemeral inspections could cause up to 5 licensees to seek alternative grazing operations with a loss of 14% of total AUMs harvested in the county - SAI Initial reductions in perennial usage could be indicated by monitoring data - AI	More ephemeral grazing would be available on 7 previously ungrazed allotments - BI	Use of 30,856 AUMs would be eliminated, most livestock operations in the county would be eliminated - SAI	Reductions would have to be made to compensate from overuse resulting from immediate increase in livestock use - AI	Strict ephemeral inspections would have the same impacts as under the Proposed Action - SAI Immediate reductions in livestock grazing would decrease AUMs harvested - AI
Long Term	A net increase in available AUMs would occur - BI	As perennial forage declines, livestock operations would become less productive - AI		A post-long-term net increase in available AUMs would occur - BI	A long-term net increase in available forage would occur - BI
Economics					
Short Term	Five ephemeral operators may suffer a loss in income of up to $12,557, and in net worth of up to $109,000 - SAI to individual, AI to county and industry.		Rancher net worth would decline by $771,400 - SAI to individuals only. Four full-time employees would be displaced - SAI to individuals only.	The following impacts would occur to ranchers: >Small Ranch Increased cash flow - BI Continued net loss - BI >Medium Ranch Cash flow up to $5,596 - SBI Net return up to $3,530 - SBI >Large Ranch Cash flow up to $18,528 - SBI Net return up to $10,310 - SBI	The following impacts would occur to ranchers: >Small Ranch Lower cash flow - AI Income may not meet fixed costs - AI >Medium Ranch Cash flow down to $1,403 - SAI Net return down to <$663> - SAI >Large Ranch Cash flow down to $5,649 - SAI Net return down to <$2,569> - SAI

SUMMARY TABLE TWO (continued)

COMPARATIVE SUMMARY OF BENEFICIAL AND UNAVOIDABLE ADVERSE IMPACTS

Environmental Elements	Alternatives: Proposed Action	No Action	No Livestock Grazing	Livestock Production	Natural Resource Protection
				Rancher net worth would increase by $120,775 - SBI to individuals only Decreased bighorn hunter-day revenue would be $2,937 annually - AI Decreased quail hunter-day revenue would be $119,360 - AI	Rancher net worth would decline by $229,775 - SAI to individuals only Increased quail hunter-days would increase economic benefits by $118,300 - BI
Long Term	Increased bighorn hunter-days would provide increased values of $128,570 - BI Increased quail hunter-days would provide increased values of from $82,810 to $591,500 - BI	Rancher sales and net income would decline - AI Hunting of bighorn and quail would decline - AI	Increased bighorn hunter-days would produce economic benefits of $284,600 - BI Increased quail hunter-days would increase economic benefits to $591,500 - BI		Increased bighorn hunter-days would increase economic benefits by $284,600 annually - BI
Benefit/Cost Ratio	1.12 to 1 (present-value benefits $707,944 to present-value costs $631,183).	0 to 1 (no or unquantifiable losses to costs of $185,852). Possible net loss.	6.4 to 1 (present-value benefits $2,644,325 to present-value costs $413,070).	0 to 1, with possible net loss of over $1.2 million.	2.55 to 1 (present-value benefits $1,618,228 to present-value costs $633,489).

Abbreviations:

AI - Adverse Impact
BI - Beneficial Impact
SAI - Significant Adverse Impact (see Determination of Significant Impacts in Chapter 3)
SBI - Significant Beneficial Impact (see Determination of Significant Impacts in Chapter 3)
E - Ephemeral
EP - Ephemeral-Perennial
I - Intensive
C - Custodial
M - Maintenance
AMP - Allotment Management Plan
HMP - Habitat Management Plan
AUM - Animal Unit Months
B/C - Benefit-to-Cost
<$> - Loss

Source: Clark County EIS Team 1982.

CHAPTER ONE

ALTERNATIVES INCLUDING THE PROPOSED ACTION

PURPOSE OF AND NEED FOR ACTION

The purpose of the Clark County Grazing Environmental Impact Statement (EIS) is to analyze the potentially significant impacts which may result from implementation of a revised grazing management program in the Stateline and Virgin Valley Planning Units.

Revisions of the Clark County land use plan, consisting of the Unit Resource Analysis - Management Framework Plan (URA-MFP), were made in 1980-1981. MFP Step 2 is a series of 87 specific proposals to resolve or mitigate those issues. Several of those proposals deal with range management issues. Those proposals form the basis of the Proposed Action analyzed in this document.

(A brochure summarizing all MFP Step 2 proposals was distributed to the public and government agencies on November 23, 1981, for review and comment. That period ends June 30, 1982. This EIS represents a formal portion of that review, with respect to the range management proposals only. All recipients of this EIS should have received a copy of that brochure. However, additional copies of that publication are available on request from the Las Vegas BLM District Office (4765 W. Vegas Dr., P.O. Box 26569, Las Vegas, Nevada 89126, (702) 385-6403).

Four alternatives were developed for analysis. They are No Action, No Livestock Grazing, Livestock Production, and Natural Resource Protection. These alternatives and the Proposed Action are described in detail in this chapter.

RESOURCE PROBLEMS

Eight major resource problems were identified during the land use planning and scoping processes. Objectives for resolving each of these problems were then developed. The problems and objectives are:

1. **Problem:** Viable populations of desert tortoise exist in less than 25 percent of the animal's habitat found in Clark County. A key factor in recruitment is the availability of spring annual forage to female desert tortoises. **Objective:** In crucial habitat areas, assure adequate amounts of spring ephemeral forage are made available to desert tortoise.

2. **Problem:** Although Clark County rangeland is classified *ephemeral*, significant unrecognized use is made of perennial forage, resulting in improper utilization in some cases and missed opportunities for improved livestock forage condition in others. **Objective:** Manage the perennial vegetation resource at proper utilization rates to obtain a sustained yield and to improve livestock forage condition.

(See the Livestock Grazing section in Chapter Two for a discussion on *ephemeral* and *ephemeral-perennial* grazing administration.)

3. **Problem:** Populations of bighorn sheep in Clark County have declined from historic levels and, in some cases, vacated historic ranges. **Objective:** Provide sufficient habitat to attain and maintain reasonable numbers of bighorn sheep.

4. **Problem:** Riparian habitats (a total of no more than 10 acres) associated with 18 spring sources are being degraded by excessive livestock or wild burro use (trampling, fecal contamination, etc.). (Note: Five of these spring sources also are year-long bighorn sheep waters, see Problem 3, above.) **Objective:** Where possible, provide water for those animals away from riparian areas.

5. **Problem:** Nine major desert wash areas, amounting to some 10,000 acres, are receiving concentrated, unrelieved pressure from livestock. **Objective:** Provide grazing systems in affected allotments to relieve the grazing pressure.

6. **Problem:** A burgeoning wild burro population in the southern portion of the Gold Butte allotment is accelerating a vegetation community change to exclusively white bursage, creosotebush, and burrobush. **Objective:** Manage wild burros in the allotment at levels which will, over the long term, stabilize the existing vegetation community and increase plant diversity.

7. **Problem:** Small game (chukar, quail, rabbits, etc.) populations fluctuate dramatically between wet and dry years as, in the latter, they compete strongly with ungulates for food near available water sources. **Objective:** Maintain habitat circumstances that would keep populations as close to wet-year levels as possible.

8. **Problem:** Domestic sheep are licensed in the Bunkerville and Christmas Tree Pass allotments which contain (to a very small extent in the latter case) bighorn sheep habitat. **Objective:** Devise grazing systems/facilities which would preclude common use of areas by the two different animals.

TIMEFRAMES

The period of time referred to as short term is 5 years from the MFP Step 3 decisions based on this EIS; long term is 25 years from that point.

ALLOTMENT CHARACTERISTICS

Table 1-1 depicts the current situation on the 49 allotments/areas in Clark County. Of these 49, two (Azure Ridge and Mesquite Community) are small portions of two Arizona Strip District allotments which have already been classified as ephemeral-perennial and are to be managed intensively.

Tentative "Selective Management" categories have been identified for the 34 grazed allotments in Clark County, based on allotment characteristics. The proposed categories are shown on Table 1-2 and will be used as an analysis tool in all but two alternatives (No Action and No Livestock Grazing) in this document. A general discussion is located later in this chapter. A discussion of its application in Clark County is in Appendix A.

Fifteen areas or allotments within Clark County are currently ungrazed. Eight are unallotted and seven have not been grazed since at least 1975. Each has certain existing uses or natural resources present such that were livestock grazing to be resumed, conflict probably requiring intensive management to resolve would be created (see Table 1-3). The MFP recommendation for these allotments was that they not be grazed. The Proposed Action and Natural Resource Protection Alternative reflect that recommendation (see Table 1-2).

Because of a wild burro-riparian area conflict, one allotment nominated for nongrazing (Spring Mountain) would be managed initially as an Improve allotment (see Table 1-2).

PROPOSED ACTION

The Proposed Action was developed mainly through the land use planning process (Clark County MFP Step 2) and considered in light of present funds available for resource management. It is designed to respond to Problems (see above) identified in both the MFP-2 conflict analysis and the EIS scoping process. The following discussion explains the proposals to be implemented in the short term (5 years) and the long term (20 years) and which Problems they help alleviate.

Grazing, initially, would continue at existing levels of livestock, wild horses and burros, and wildlife.

Short-Term Management Actions

Of the 49 allotments in Clark County, 18 would be reclassified from ephemeral to ephemeral-perennial (see Table 1-2). These allotments meet the criteria for that classification as described in the Livestock Grazing section of Chapter Two. The ephemeral classification of 16 other allotments would remain unchanged. These allotments have the ephemeral range characteristics described in Chapter Two. Fifteen areas or allotments within Clark County would have no livestock grazing. These areas have existing uses or natural resources that would conflict with livestock grazing should it be initiated. Eight of the 15 are unallotted and seven have not been grazed since at least 1975 (see Table 1-3). On the 18 ephemeral-perennial allotments, base herds and periods-of-use would be determined by BLM through the Coordinated Resource Management and Planning (CRMP) process, based on monitoring. Lacking an established preference, a five-year-average licensed use of 24,158 AUMs (1975 through 1979; Table 1-1) would serve as an initial stocking rate on the 16 Nevada-administered ephemeral-perennial allotments. This would aid in solving Problem 2.

(Decisions on the final classification of the 49 allotments would be made after consultation through the CRMP process and in the case of nongrazing, after the provisions of the Federal Land Policy and Management Act regarding elimination of uses (Sec. 202(e)(2), 1976) is accomplished. The Proposed Action represents the most likely mix of classifications apparent to BLM at this time. However, management emphasis on those allotments identified as having perennial forage potential would be on that perennial base during the interim pending reclassification.)

Strict inspection of annual plant growth prior to licensing ephemeral use would be accomplished on all allotments. In the course of that inspection, consideration would be given to other resource needs and values (including desert tortoise and wild horses and burros). This would alleviate Problem 1 and aid in solving Problems 2, 3, and 7.

Wild horse and burro use would continue at current levels in all herd use areas, initially. Adjustments would be made following monitoring to achieve sustained yield utilization. Desirable numbers of wild horses or burros would be determined through the CRMP process based on monitoring data. This would address Problem 6.

Bighorn sheep habitat would initially be managed to support existing populations in current habitat. Where AMPs and habitat management plans (HMPs) are to be developed, work would occur concurrently to accomplish a mutual resolution of conflicts (see Table 1-4). This would help solve Problems 3 and 8.

With respect to the 16 Nevada-administered ephemeral-perennial allotments, allotment management plans (AMPs) would be developed and implemented on seven allotments, the Crescent Peak AMP would be revised, and grazing systems would be devised and implemented on the remaining eight ephemeral-perennial allotments.

The systems and AMPs would involve establishment of proper period-of-use as well as use of appropriate grazing treatments. Although systems would be initiated in the short term, full adjustment and implementation would not be accomplished until well into the long term, based on monitoring results.

The two basic systems are rest-rotation and deferred-rotation. Each system would be prepared based on the perennial forage base and the particular management objectives for the allotment. One of the systems or an appropriate variation could be used on each of the 16 Nevada-administered ephemeral-perennial allotments. Selection of the appropriate system would be done through CRMP consultation. Long-term adjustments to the systems would be based on monitoring.

Rest-rotation grazing within a three-year system is designed to rest a pasture or area from grazing for an entire year. Plants in the rested areas can pass through their entire annual cycle free from grazing pressures.

Deferred-rotation grazing delays grazing on a portion of an allotment during the critical spring growing period and rotates the deferment among pastures. This system allows plants in each pasture, in turn, to accomplish the essential seed production stages undisturbed by grazing.

Under both the rest-rotation and deferred-rotation grazing treatments, no ephemeral grazing would take place in those areas undergoing rest. These actions would aid in solving all Problems, but particularly numbers 1, 3, 5, 7, and 8.

There would be development of .7 miles of fence, 13 water troughs, and 1,300 feet of pipeline (as shown in Table 1-5) to protect 18 riparian areas associated with natural springs and provide water to livestock or wild horses/burros outside the exclosure. This will aid in solving Problem 4.

There would be 1.9 miles of bighorn sheep fence, 22.6 miles of pipeline, and 15 water troughs developed to protect 15 springs used by bighorn sheep and livestock and to provide water for livestock away from the source (see Table 1-5). Five of these springs also have associated riparian zones. These actions will help solve Problems 3 and 4.

Seven miles of pipeline, 6 troughs, 6.6 miles of fence, and one water tank would be developed (as shown in Table 1-5) to improve livestock distribution and forage utilization. These actions will aid in solving Problem 2.

Long Term

In the long term, management emphasis would be placed on continued monitoring of the, by then, 15 Nevada-administered intensively managed ephemeral-perennial allotments. One allotment would have been changed to the maintenance category. Problems 2 and 3 on the Spring Mountain and Lime Springs allotments would probably have been resolved, causing the former to be dropped from any category (being ungrazed) and the other to revert to the custodial category. Problem 4 may have been eliminated.

Long-term livestock-related actions would consist largely of developing additional range improvements on the intensively managed allotments to provide better livestock distribution and to make available additional perennial livestock forage by widening water-serviced areas. This would be accomplished at a development rate comparable to the short term as funding would be expected to remain essentially unchanged, making an additional $340,000 available over the 20-year period (see Table 1-6).

Wildlife funds in the long term would be largely devoted to developing the remaining estimated $700,000 of HMP implementation work in current bighorn sheep habitat identified by BLM and NDW in a joint study as necessary to achieve reasonable numbers (Janke 1979). That study, which is incor-

porated into this EIS by reference, delineates specific wildlife project work needed to resolve livestock-bighorn sheep conflicts. An additional $100,000 would be available to support HMP implementation for other wildlife species.

Cost

Table 1-6 outlines the cost of implementing the developments in the short and long term. The budget of $287,000 for the short term is based on current funding levels for both livestock and wildlife projects.

NO ACTION ALTERNATIVE

Under this alternative, range management in Clark County would continue as it exists at the time the EIS is being prepared. All allotments would continue to be classified as ephemeral range, and annual plant growth would not necessarily be field-evaluated prior to ephemeral licensing. On 16 Nevada-administered allotments there could be, as there is now, continued significant use of a perennial base which is not managed as such.

Eight unallotted areas would continue ungrazed, but the seven ungrazed allotments could be grazed upon appropriate application.

Wildlife habitat would be managed to satisfy the requirements of existing numbers in existing locations, although natural expansion of numbers and ranges would not be opposed. No major wildlife-related projects would be initiated. Most work would be aimed at maintenance of existing projects.

Wild horses and burros would continue to be managed in their existing habitat at current numbers. Periodic removals would be accomplished to maintain the status quo.

No major livestock grazing developments would be initiated. The bulk of range improvement funding would be devoted to maintenance of existing projects.

NO LIVESTOCK GRAZING ALTERNATIVE

The No Livestock Grazing Alternative has as a major goal the alleviation of Problems 1, 3, and 5.

Under this alternative, all domestic livestock would be excluded from BLM-administered land in Clark County. Exclusion would begin in 1983 following the District Manager's decision and would be completed in five years. This action would alleviate Problem 1 and help solve Problems 3 and 5.

Wildlife habitat would be managed to satisfy the requirements of bighorn sheep in both existing and historic ranges. Reintroductions into historic ranges would be made as quickly as prudent management would allow removals from existing herds. Springs and other water sources on public lands required by the sheep would be maintained by BLM. This would help solve Problem 3.

Some 40 wildlife guzzlers would be developed to provide expanded bighorn sheep habitat. This would help solve Problem 3.

In the Spring Mountain allotment, two springs would be fenced where riparian habitat is now being damaged and water would be piped away for wild burro use. This would help solve Problem 4.

Wild burros in the Gold Butte area would be reduced by 98 animals and an intensive monitoring program instituted. This would aid in solving Problem 6. The removed animals would be relocated in Clark County: 83 to the Muddy Mountain/White Basin allotment areas and 15 to the western slopes of the Eldorado Mountains (Ireteba Peaks allotment). The wild horses and burros on the Spring Mountain Range would be allowed to increase by 20 percent.

Generally, monitoring would be accomplished county-wide to assure that neither wildlife nor wild horses and burros are overutilizing available forage. Areas where potential problems were noted would be monitored as key areas (see Gold Butte, above).

LIVESTOCK PRODUCTION ALTERNATIVE

The Livestock Production Alternative would emphasize the use made of range forage by livestock. Range management decisions in areas of livestock-wildlife or livestock-wild horse interactions would favor livestock. Range improvements are limited to those that could be constructed under projected levels of funding.

Short-Term Management Actions

All allotments in Clark County would be managed according to the classification and intensity described in the Proposed Action (see Table 1-2). On the 16 Nevada-administered ephemeral-perennial allotments, livestock grazing would be licensed at 20 percent above the five-year-average use (1975-79). This would set usage on those 16 allotments at 28,989 AUMs.

Ephemeral grazing would be licensed on the 15 allotments identified in the Proposed Action for no grazing, provided the licensee establishes a water haul system for those allotments where water rights are held by another.

Ephemeral usage would be licensed on all allotments without field inspections or considerations of other resource values.

The burros in the Muddy Mountain, Eldorado, and Gold Butte herd use areas would be reduced by half to provide forage for livestock. This would eliminate 380 burros and would help solve Problem 6.

Unless conflict-resolving actions would be detrimental to livestock, current numbers of bighorn sheep would be maintained. However, the bighorn sheep in the Bunkerville and Christmas Tree Pass allotments would be removed, either through hunting or natural causes. This would solve Problem 8.

AMPs and grazing systems would be developed for allotments as shown in the Proposed Action. This would address Problem 2.

Five troughs, 4.5 miles of pipeline, and one water tank would be constructed to improve forage utilization and livestock distribution.

Forty-one guzzlers would be developed to provide waters to bighorn sheep in current habitat. This would address Problem 3.

Long Term

In the long term, monitoring of the 16 intensively managed ephemeral-perennial allotments would continue to provide utilization data to assist in adjusting grazing numbers. Range improvement funds would be used to continue to improve livestock distribution and to bring more perennial forage within water-serviced areas.

Wildlife funds would be used primarily for additional bighorn sheep guzzlers to offset increased livestock use of natural springs and waters.

Cost

Table 1-6 shows the costs of implementing this alternative, using current funding levels.

NATURAL RESOURCE PROTECTION ALTERNATIVE

The Natural Resource Protection Alternative has as a major goal the protection and enhancement of wildlife and vegetation resources on public lands in Clark County. This alternative includes protection of all areas from overgrazing by livestock, wildlife, or wild horses and burros as well as protection of riparian areas and desert washes (Table 1-7). Decisions in areas of livestock-wildlife and wild horse/burro-wildlife conflicts would favor wildlife. A major concern of this objective is the alleviation of Problems 1, 3, and 7.

Short-Term Management Actions

Allotment classifications and management intensities would be as described in the Proposed Action. Livestock usage on the 16 Nevada-administered ephemeral-perennial allotments would be licensed initially at 20 percent below the five-year-average licensed use (1975 through 1979; Table 1-1). This would mean an initial grazing usage of 19,327 AUMs on those allotments. This would aid in solving Problems 2 and 3.

On all allotments, strict inspection of annual plant growth would be accomplished prior to licensing ephemeral use. In the course of that inspection, reservation of a specific amount of forage, to be predetermined through the CRMP process, would be made for the desert tortoise. This would alleviate Problem 1 and aid in solving Problems 2, 3, and 7.

Wild horses and burros would be managed for current numbers in existing locations except in the Gold Butte herd use area where 250 burros would be removed, reducing the herd by half. This action would help solve Problem 6.

Domestic sheep grazing would be eliminated from the Bunkerville and Christmas Tree Pass allotments. This would solve Problem 8.

Monitoring of all grazing animals would be accomplished to make adjustments leading to sustained-yield utilization levels.

The wildlife waters and riparian habitat protection measures described in the Proposed Action would be accomplished. This would address Problems 3, 4, and 7.

Development of 7.3 miles of livestock water pipeline, 6 troughs, and one water tank would be done to improve livestock distribution. This would help solve Problem 2.

AMPs and grazing systems as described in the Proposed Action would be developed and implemented. This would alleviate Problem 5.

Long Term

Long-term funding would be used to continue emphasis on improving wildlife habitat. Bighorn sheep habitat management plans as identified by Janke (1979) would be accomplished for current habitat. As habitats are determined able to support them, bighorn sheep would be reintroduced into historic habitats.

Cost

Table 1-6 shows the costs of implementing this alternative, using current funding levels.

IMPLEMENTATION

The revised grazing management program the Las Vegas District will inaugurate on public rangelands in Clark County following this EIS will have the following general objectives:

1. Authorize livestock grazing of the public rangelands under the principles of multiple use and sustained yield;

2. Protect, maintain, and improve the rangeland resources through sound land use and grazing management decisions;

3. Conduct the level of soil and vegetation inventories necessary to support management decisions and provide a baseline for monitoring programs;

4. Increase and encourage systematic cooperation, consultation, and coordination with rangeland users as part of the land use and grazing management decision-making process;

5. Determine appropriate stocking levels (including proper periods and areas of use) based on monitoring data, and authorize livestock grazing consistent with those stocking levels;

6. Initiate cost-effective rangeland improvements that will help improve the condition of the lands for livestock grazing, wildlife habitat, wild horses and burros, etc.; and

7. Monitor rangeland resources and livestock use to assist in determining proper stocking levels and measure progress toward achieving management objectives.

Coordinated Resource Management and Planning

Coordinated Resource Management and Planning (CRMP) is a public involvement process intended to bring together citizens, agencies, and interest groups to focus their problem-solving energies on an issue or problem in which most or all of them have an interest. All affected interests can actively participate in the planning process through CRMP and their input will be considered before BLM makes a final decision on grazing management actions.

In terms of range management in Clark County, the task of the CRMP process would be to apply the county-wide decisions on range classification and management intensities flowing from this EIS to specific allotments or areas in Clark County. The participants would focus on specific resource use incompatibilities within an identified geographic area. The objective of the process would be to develop grazing management schemes, resource management facilities, and forage allocations which would optimize multiple use of the public rangelands of Clark County, as well as enhance the conditions of the basic vegetation and soil resources of the range. Although the consultative process of CRMP is the committed direction of the BLM in reaching rangeland use decisions, the District and Area Managers in Las Vegas retain the authority and responsibility to make resource use adjustments independently of CRMP when data and conditions require such action.

An essential element of the CRMP process is the development, through resource monitoring, of a creditable and mutually acceptable data base to support the detailed planning process.

Selective Management

To implement any of the three alternatives, other than No Action or No Livestock Grazing, a selective

management approach to rangeland management will be made for the purpose of improving or maintaining the public land resources. This approach is based on the concept that: (1) an allotment's resource characteristics, management needs, and potential for improvement can be identified, and (2) the timing and intensity of the management actions should be varied according to an allotment's identified needs and potential.

To facilitate the selective management approach, the BLM has developed three categories into which allotments will be grouped according to their potential: maintain (M), improve (I), and custodial (C). Objectives for these categories are to: (1) *maintain* current satisfactory condition; (2) *improve* current unsatisfactory condition; and (3) manage *custodially*, while protecting existing resource values. The following general criteria pertain to the three categories, although allotments within each category will not have to meet all the criteria to be managed according to the category objectives:

Maintain Category Criteria

-Present range condition is satisfactory.

-Allotments have moderate or high resource production potential, and are producing near their potential (or trend is moving in that direction).

-No serious resource-use conflicts/controversy exist.

-Opportunities may exist for positive economic return from public investments.

-Present management appears satisfactory.

-Other criteria appropriate to EIS area.

Improve Category Criteria

-Present range condition is unsatisfactory.

-Allotments have moderate to high resource production potential and are producing at low to moderate levels.

-Serious resource-use conflicts/controversy exists.

-Opportunities exist for positive economic return from public investments.

-Present management appears unsatisfactory.

-Other criteria appropriate to EIS area.

Custodial Category Criteria

-Present range condition is not a factor.

-Allotments have low resource production potential, and are producing near their own potential.

-Limited resource-use conflicts/controversy may exist.

-Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.

-Present management appears satisfactory or is the only logical practice under existing resource conditions.

-Other criteria appropriate to EIS area.

After publication of the Final EIS and categorization of allotments using the selective management criteria, the implementation of the Land Use/Grazing Decisions by category is shown on Table 1-8.

Management Supervision Procedures

A vegetation monitoring system which would include measurement of utilization, actual use, climate, and range condition and trend would be used, primarily in perennial use areas. Monitoring was initiated in 1982 in Clark County. Monitoring methods include (in order of priority of data need):

Utilization: The BLM would use the Key Forage Plant Method--a visual estimate for judging utilization of key species by weight. In this method, the examiner divides noticeable utilization among five classes of use within a key area: slight (0-20 percent), light (21-40 percent), moderate (41-60 percent), heavy (61-80 percent), and severe (81-100 percent). Grazing areas would be managed for an annual utilization of 55 percent for perennial grasses and forbs, and 45 percent for shrubs.

Actual Use: Livestock operators would provide records of actual livestock use and BLM personnel would verify this information through periodic allotment checks. Use of the range by wild horses and burros would be determined through census figures, with refinement made by period-of-use data as necessary. Actual use and period-of-use by bighorn sheep would be determined from pellet count and aerial surveys.

Climatic Data: Annual precipitation and growing season have a marked influence on vegetation growth and production. Official weather stations and BLM and state weather stations would provide the climatic data. These data would be used to correlate climate to plant growth determined in the utilization and trend studies.

Condition and Trend: Condition of a range site is determined by comparing composition by weight of the present plant association with that of the site's climax plant community. Trend is the direction of change in condition of the range observed over

time. Changes in trend are categorized as upward, downward, or not apparent (static), and from three to five years of observation are needed before any trend can be detected on most range sites. Trend is measured by noting changes in the frequency of key species in key areas over time, using the Quadrat Frequency Method.

For more detailed information on these monitoring procedures, refer to the 1981 draft of the "Nevada Range Monitoring Procedures" (Nevada Range Studies Task Group 1981) and the BLM Monitoring Studies Manual (USDI, BLM, 1968).

The monitoring program for those allotments in the M and C categories would be of low intensity, focusing on changes in ownerships or livestock operations. In the I category allotments, monitoring intensity would be variable, focusing on the effect of management actions on range condition.

The monitoring program, along with input through CRMP, would determine the time at which range management action would be needed in a particular allotment. A partial list of possible actions are: change in livestock period-of-use, construction of fences, water development, adjustment of wild burro numbers, and livestock adjustment. The monitoring program would be an integral part of all the alternatives analyzed in this EIS except the No Action Alternative.

Additional monitoring will be conducted in crucial wildlife and wild horse and burro areas. Information gained through these efforts and other studies will be used in making any grazing decisions.

STANDARD OPERATING PROCEDURES

Certain requirements are inherent in the implementation of any federal action on BLM-administered public lands. These requirements, or Standard Operating Procedures, are designed to mitigate impacts caused by construction of support facilities and would be followed in the construction of those facilities necessary to implement any of the alternatives, including the Proposed Action.

1) A site-specific environmental review will be conducted before project development so that, depending on impact of this action on the resources, modification or abandonment of the project may be considered.

2) Compliance with wilderness guidelines on proposed projects will be in accordance with Section 603(c) of the Federal Land Policy and Management Act (1976) which provides that until Congress acts on the Bureau's wilderness suitability recommendations for wilderness study areas or on lands still under wilderness review, the following policy will prevail: existing mining and grazing uses and mineral leasing activities may continue in the same manner and degree as was being conducted on October 21, 1976, but new or expanded existing uses will be allowed only if the impacts of these uses would not impair the area's suitability for designation as wilderness. Proposed uses and projects will be analyzed on a case-by-case basis to assure compliance with the *Interim Management Policy and Guidelines for Lands Under Wilderness Review*, and when applicable, the regulations in 43 CFR Part 3800, Subpart 3802, *Exploration and Mining Wilderness Review Program*. Certain exceptions to the above-stated policy which concerns valid existing rights are explained in these documents.

3) All actions would be in compliance with BLM Visual Resource Management Design Procedures in BLM Manual 8400. On any project that has a visual contrast rating that exceeds the recommended maximum for the visual class zone in which it is proposed, the visual contrast is considered significant and mitigating measures must be examined. The ultimate decision in these cases of whether a particular project's visual impact is positive or negative, acceptable or unacceptable, rests with the District Manager and must be made on a project-by-project basis.

4) Threatened or endangered plant or animal species' clearance is required before implementation of any project. Consultation with the Fish and Wildlife Service per Section 7 of the Endangered Species Act is necessary if a threatened or endangered species or its habitat may be impacted. If there is deemed to be an adverse impact, either relocation or abandonment of the project will follow.

5) Cultural resource protection requires compliance with Section 106 of the National Historic Preservation Act of 1966, Section 206 of the National Historic Preservation Act Amendments of 1980, Section 101(b)(4) of the National Environmental Policy Act (NEPA) of 1969, Section 2(b) of Executive Order 11593, and the Federal Land Policy and Management Act of 1976. Prior to project approval, intensive field inventories will be conducted in specific areas that would be impacted by implementing activities. Impacts to National Register and National Register Eligible sites will be assessed on a regular basis. Management decisions will be regularly reviewed and revised based on the findings of surveys and monitoring of sites.

6) When required, excess wild horses and burros will be removed from public lands and put in the custody of individuals, organizations, or other gov-

ernment agencies. No field destruction of wild horses or burros will be allowed without appropriate authorization, except for humane reasons in the case of sick or lame animals.

7) Permanent roads and trails would not be constructed to project sites. Existing access or off-road travel would be used where needed.

8) Fence construction must comply with BLM Manual 1737. Lay-down fences will be constructed in wildlife and wild horse areas if necessary and feasible. Fences in wild horse areas will be constructed to minimize interference with normal distribution and movement patterns of the majority of animals within the herd use areas or herd management areas.

9) Water for wildlife and wild horses and burros is to be made available in allotments and rested pastures.

10) Water improvement sites will have bird ramps in watering troughs.

11) Spring developments will be fenced on a case-by-case basis to prevent overgrazing and trampling of adjacent vegetation, to provide escape areas for small wildlife, and to prevent damage to the development itself. Water for these spring developments will be maintained at the source.

12) When the need is identified, water gaps and crossings will be constructed in fences providing protection to stream bottoms to allow livestock and wild horses and burros access to water.

13) All refuse in the project area will be removed to a sanitary landfill.

14) Areas of critical environmental concern will receive priority evaluation and, if threatened with immediate disruption, emergency designation and protection during the land use planning process per Sections 201 and 202 of the Federal Land Policy and Management Act.

15) Clearing vegetation from project sites requiring excavation would be held to a minimum.

16) All disturbed areas which have the capability of producing vegetation will be reseeded with native and/or introduced species as soon as possible to replace ground cover on the sites.

TABLE 1-1
CURRENT CHARACTERISTICS OF ALLOTMENTS IN CLARK COUNTY

Allotment	Status(1)	Acres	Five-Year-Average(2) Licensed Use (AUMs)	Current Use Pattern(3)	Problem Areas(4)
Acton-Farrier	G	45,536	53	Mar-May, Sep-Nov	1
Arrow Canyon	G	101,698	304	Mar-May, Sep-Nov	1
Azure Ridge(5)	G	6,914	NA	Yearlong	-
Billy Goat Peak	G	49,133	1,397	Yearlong	1,2,3,4
Black Butte	G	36,312	56(6)	Yearlong	-
Bunkerville	G	139,639	745	Mar-May, Nov-Dec	1,2,3,4,8
Christmas Tree Pass	G	89,255(7)	3,711(6)	Yearlong	1,3,8
Crescent Peak	G	119,320	5,986	Yearlong	1,2,3,5
Dry Lake	G	69,399	199	Mar-May	1
Flat Top Mesa	G	5,338	48	Mar-May, Sep-Nov	-
Glendale	A	22,353	0	No Use	-
Gold Butte	G	172,549	2,730	Yearlong	1,2,3,4,6
Hen Springs	G	22,756	867	Mar-May, Sep-Jan	2,3
Hidden Valley	G	69,436	445	Mar-May, Nov-Feb	2
Ireteba Peaks	G	344,607(7)	1,849	Yearlong	1,2,3,4,5
Jackrabbit	G	4,414	204	Mar-May, Sep-Nov	-
Jean Lake	G	137,217	3,529(8)	Yearlong	1,2,3,4,5
Kyle Canyon	A	34,494	0	No Use	-
Lime Springs	G	2,384	189	Mar-May	3
Lower Mormon Mesa	G	43,640	612	Mar-May, Sep-Nov	-
Lucky Strike	G	138,776	240	Yearlong	2,5
McCullough Mountain	G	230,272	2,670	Yearlong	1,2,3,4,5
Mesa Cliff	G	14,072	139	Mar-May	-
Mesquite Community(5)	G	13,106	NA	Yearlong	-
Muddy Mountains	G	243,170	207	Mar-May	1,2,3
Muddy River	A	20,081	0	No Use	-
Newberry Mountains	A	70,384(7)	0	No Use	-
Overton Arm	A	5,221	0	No Use	-
Pittman Well	A	39,595	0	No Use	-
Pulsipher Wash	G	3,230	90	Mar-May, Sep-Nov	-
Roach Lake	G	14,986	292	Yearlong	2
Rosen Spring	U	12,330	-	No Use	-
Rox	A	21,736	0	No Use	-
South Point	G	22,998	216	Yearlong	-
Spring Mountain	U	310,364	-	No Use	3,4
Stump Springs	G	50,535	228(9)	Yearlong	-
Sunrise Mountain	U	34,272	-	No Use	-
Table Mountain	G	92,269	174(9)	Yearlong	1,2,3,4
Topaz Sheep	G	29,793	393	Mar-May	-
Upper Mormon Mesa	G	47,659	779	Mar-May, Sep-Nov	1,2
Ute	G	70,280	107(9)	Mar-May	-
Wheeler Slope	U	98,952	-	No Use	-
Wheeler Wash	G	129,678	1,251	May-Nov	1,4,5
White Basin	G	171,360	997	Mar-May, Sep-Nov	2,3
Younts Spring	G	23,202	149	Yearlong	-
5555 (Indian Springs)	U	6,786	-	No Use	-
6666 (River Mountains)	U	10,371	-	No Use	-
7777 (Las Vegas Valley)	U	62,243	-	No Use	-
9999 (Lake Mead NRA)	U	106,654	-	No Use	-
		3,610,769	30,856		

(1) G = Grazed; A = Allotted but not grazed; U = Unallotted.
(2) Grazing years 1975 through 1979.
(3) As all allotments are classified ephemeral, there is no authorized period-of-use. This column indicates the time frames within which operators have normally sought and received grazing licenses.
(4) Resource Problems 1 through 8 are described under Resource Problems in Chapter One. All allotments have Problem 7.
(5) Azure Ridge and Mesquite Community allotments (in Clark County) are small areas of larger allotments managed by the Arizona Strip District. That district has already determined that the entire allotments will be managed intensively under an ephemeral-perennial classification. Licensed AUMs for these two allotments will not be evaluated in this EIS.
(6) Average of two years only.
(7) Acreage includes lands within Lake Mead NRA, subject to withdrawal.
(8) Average of four years only.
(9) One year use, four years non-use.

Source: Clark County URA 1981; Clark County EIS Team 1981.

TABLE 1-2

PROPOSED SHORT-TERM MANAGEMENT INTENSITY AND
RANGE CLASSIFICATION IN CLARK COUNTY

Allotment	Management Intensity (1)	Range Classification(2)
Acton-Farrier	C	E
Arrow Canyon	C	E
Azure Ridge(3)	I	EP
Billy Goat Peak	I	EP
Black Butte	C	E
Bunkerville	I	EP
Christmas Tree Pass	C(4)	E
Crescent Peak	I	EP
Dry Lake	C	E
Flat Top Mesa	C	E
Glendale	NG	NG
Gold Butte	I	EP
Hen Springs	I	EP
Hidden Valley	I	EP
Ireteba Peaks	I	EP
Jackrabbit	C	E
Jean Lake	I	EP
Kyle Canyon	NG	NG
Lime Springs	I(5)	E
Lower Mormon Mesa	C	E
Lucky Strike	I	EP
McCullough Mountains	I	EP
Mesa Cliff	C	E
Mesquite Community(3)	I	EP
Muddy Mountains	I	EP
Muddy River	NG	NG
Newberry Mountains	NG	NG
Overton Arm	NG	NG
Pittman Well	C	E
Pulsipher Wash	NG	NG
Roach Lake	I	EP
Roses Spring	NG	NG
Rox	NG	NG
South Point	C	E
Spring Mountain	NG-I(6)	NG
Stump Springs	C	E
Sunrise Mountain	NG	NG
Table Mountain	I	EP
Toquop Sheep	C	C
Upper Mormon Mesa	I(7)	EP
Ute	C	E
Wheeler Slope	NG	NG
Wheeler Wash	I	EP
White Basin	I	EP
Younts Spring	C	E
5555	NG	NG
6666	NG	NG
7777	NG	NG
9999	NG	NG

Summary:	Management Intensity				
	M	I	C	NG	Total
No. Allotments	0	20	15	14	49
Acres	0	2,455,595	609,702	545,472	3,610,769

Summary:	Probable Long-Term Management Intensity				
	M	I	C	N	Total
No. Allotments	1	17	16	15	49
Acres	47,659	2,095,188	612,086	855,836	3,610,769

(1) I = Improvement or Intensive; C = Custodial; M = Maintenance; NG = Nongrazed

(2) E = Remain classified Ephemeral; EP = Reclassified Ephemeral-Perennial; NG = Nongrazed

(3) Azure Ridge and Mesquite Community allotments (in Clark County) are small areas of larger allotments managed by the Arizona Strip District. That district has already determined that the entire allotments will be managed intensively under an ephemeral-perennial classification.

(4) The acreage of this allotment involved in Problem 3 (717 acres) was considered minor and insufficient to warrant Intensive management.

(5) Based on bighorn sheep conflicts only.

(6) The Spring Mountain allotment, although ungrazed, has several springs being degraded by wild burro usage.

(7) When this allotment is reclassified to ephemeral-perennial, it will then move immediately to the Maintenance category of management intensity.

Source: Clark County EIS Team 1982.

TABLE 1-3

PROPOSED ACTION AND NATURAL RESOURCE PROTECTION ALTERNATIVE -
AREAS OF NO LIVESTOCK GRAZING IN CLARK COUNTY

Area or Allotment	Acres	Conflict
Glendale	22,353	Desert Tortoise
Kyle Canyon	34,494	Bighorn Sheep, Private Land, State Highway
Muddy River	20,081	Private Land, State Highway
Newberry Mountains	70,384	Bighorn Sheep, Desert Tortoise
Overton Arm	5,221	Private Land
Pittman Well	39,595	Desert Tortoise
Roses Spring	12,330	Unallotted, Bighorn Sheep
Rox	21,736	Desert Tortoise
Spring Mountains*	310,364	Unallotted, Desert Tortoise, Bighorn Sheep
Sunrise Mountain	34,272	Unallotted, Desert Tortoise, Bighorn Sheep
Wheeler Slope	98,952	Unallotted, Bighorn Sheep
5555 Indian Springs	6,786	Unallotted
6666 River Mountains	10,371	Unallotted, Bighorn Sheep
7777 Las Vegas Valley	62,243	Unallotted, Bighorn Sheep
9999 Lake Mead NRA	106,654	Unallotted, Bighorn Sheep
Total	855,836	

*Includes Red Rock Canyon Recreation Lands, 61,000 acres.

Source: Clark County MFP 1981.

TABLE 1-4

CONCURRENT DEVELOPMENT OF MANAGEMENT PLANS
IN CLARK COUNTY UNDER THE PROPOSED ACTION

Phase(1)	Allotment Management Plan (Allotment)	Habitat Management Plan(2) (Habitat Area)	Herd Management Area Plan (Herd Use Area)
I	Gold Butte		Gold Butte
	Bunkerville	Virgin Mountain	
	Wheeler Wash		
II	Crescent Peak	McCullough Mtn/	
	McCullough Mtn.	Highland Range	
	Hidden Valley		
III	Ireteba Peaks	Eldorado Mountain	Eldorado Mtn.
IV	Jean Lake		

(1) Probable priority for accomplishment.
(2) HMPs for bighorn sheep.

Source: Clark County MFP 1981; Clark County EIS Team 1982.

TABLE 1-5

WILDLIFE AND LIVESTOCK MANAGEMENT FACILITIES TO
BE DEVELOPED IN THE SHORT TERM IN CLARK COUNTY UNDER THE PROPOSED ACTION

Allotment	Fencing(1)	Fencing(2)	Pipeline(3)	Troughs/ Tanks(4)
Billy Goat Peak	X	X	X	X
Bunkerville	X	X	X	X
Crescent Peak		X	X	X
Gold Butte	X	X	X	X
Ireteba Peaks			X	X
Jean Lake	X	X	X	X
McCullough Mtn.	X	X	X	X
Newberry Mtn.	X		X	X
Spring Mtn.	X	X	X	X
Table Mtn.		X	X	X
Wheeler Wash	X		X	X
White Basin	X	X	X	X
Total Units	6.7 mi	1.9 mi	29.5 mi	35
Per Unit Cost	$3,000/mi	$16,000/mi	$7,000/mi	$500-$13,000(4)
Total Cost	$20,100	$30,400	$206,500	$30,000

Grand Total = $287,000

(1) To help resolve Problems 2 and 4; consists of simple barbed-wire fencing.
(2) To help resolve Problem 3; consists of pipe fencing to bighorn sheep specifications.
(3) To help resolve Problems 2, 3, and 4.
(4) Troughs cost approximately $500; water tanks range to $13,000.

Source: Clark County EIS Team 1982.

TABLE 1-6

COMPARISON OF THE COST TO IMPLEMENT THE EIS
ALTERNATIVES FOR CLARK COUNTY

	Alternatives				
Short-Term Projects	Proposed Action	Resource Protection	Livestock Production	No Livestock Grazing	No Action
Fencing(1)	$ 20,100	$ 2,100	$ 0	$ 0	$18,000
Fencing(2)	30,400	30,400	0	0	0
Water Pipeline	206,500	206,500	31,500	1,000	0
Water Troughs/Tanks	30,000	30,000	15,500	1,000	0
Project Maintenance	0	0	0	0	65,000
Wild Burro Removal	**(3)	25,000	38,000	10,000	**(3)
Wildlife Guzzlers	0	0	205,000	198,000	0
Subtotal (5 Years)	$ 287,000	$294,000	$290,000	$210,000	$83,000
Long-Term Funding (20 Years)	$1,140,000	$1,140,000	$1,140,000	$700,000	$340,000
Total (25 Years)	$1,427,000	$1,434,000	$1,430,000	$910,000	$423,000

Assumptions: $7,000/mile for pipeline; $3,000/mile for fencing; $500 ea for water troughs; $16,000/mile for bighorn sheep fence; $100/head for horse and burro removal; $13,000 for a water tank; $5,000 each for wildlife guzzlers.

(1) Simple barbed-wire fence.
(2) Pipe fencing to bighorn sheep specifications.
(3) Amount unknown at this time.

Source: Clark County EIS Team 1982.

TABLE 1-7

MAJOR DESERT WASHES IN CLARK COUNTY

Wash	Allotment(s) Affected
Piute Wash	Crescent Peak McCullough Mountains
Lovell Wash	Spring Mountain
Trout Wash	Wheeler Wash
Wheeler Wash	Wheeler Wash
Potosi Wash	Spring Mountain
East Slope-Eldorado Valley (2 Systems)	Ireteba Peaks
Northeast Slope-Mt. Charleston	Lucky Strike
West Slope-McCullough Mtns.	Jean Lake

Source: Clark County EIS Team 1982.

TABLE 1-8

CATEGORICAL IMPLEMENTATION OF CLARK COUNTY GRAZING DECISIONS

	Categories		
Implementing Activities	Maintain	Improve	Custodial
Issuance of Grazing Decisions within _____ months of FEIS.	9 months	17 months	12 months
Priority for funding range improvements with appropriated funds.	2nd	1st	3rd
Priority for development/revision of allotment management plans.	2nd	1st	3rd
Use of prescribed flexibility.	Yes	Yes	No
Priority for use supervision in the absence of known unauthorized use problems.	3rd	1st	2nd

Source: Clark County EIS Team 1982.

CHAPTER TWO

AFFECTED ENVIRONMENT

INTRODUCTION

Clark County lies at the northeastern extreme of the Mojave Desert Biome. On its northern and eastern boundaries there occurs a transition into the Great Basin Biome and into the Sonoran Desert Biome.

Elevations in the county rise from 1,000 feet at Lake Mojave in the southern end of the county to 11,918 feet at Mount Charleston in the Spring Mountain Range. Generally the broad valleys tend to lie at the 2,000- and 3,500-foot levels. The mountain ranges rising from the desert floor reach varying heights below that of Mount Charleston. Principal ranges in the county in addition to the Spring Mountain Range are the McCullough Range (North and South); the Eldorado and Newberry Range; the Muddy Mountains; the Arrow Canyon Range; the Virgin Mountains; and the Gold Butte area peaks and ridges.

Temperatures in Clark County range widely over the year and differ greatly with elevation changes. Winters are mild with day and nighttime temperatures ranging from the mid-60s (degrees Fahrenheit) to the low-40s. Some freezes do occur. Summers are hot, with daytime maximum temperatures averaging 95° to 105° F and nighttime temperatures averaging a minimum of 70° to 75° F.

Precipitation is low over much of Clark County. Most of the county is in the rain shadow formed by the Sierra Nevada Range of California and the Spring Mountains. The amount of annual precipitation varies with elevation. In the valley floors average annual precipitation ranges from 4 to 8 inches. In the higher mountainous regions the range is from 12 to 20 inches per year. In Clark County most precipitation occurs from November to March, dropping to a minimum in May and June. In the July-August period there may be a slight peaking and another may occur in the September-October period. These peaks are relatively brief and coincide with particularly strong storm systems reaching the area from either the Pacific Ocean or the Gulf of Mexico.

The source for the above brief discussion and the location of more detailed information is the Clark County Unit Resource Analysis (1980-1981).

WATER RESOURCES

Clark County lies within the Colorado River Basin and the Central hydrographic region. Major drainages include the Colorado River, Virgin River, Muddy River, Meadow Valley Wash, and Las Vegas Wash. The EIS area is traversed by many washes, which only contain water after a rainfall.

Springs are generally the most important sources of water for wildlife, wild horses and burros, and livestock. They occur throughout the county and usually provide a dependable supply of water. Stock wells, reservoirs, and wildlife guzzlers are also common. These are used to supplement naturally occurring waters and extend the range of grazing animals or wildlife.

Groundwater is of great importance in this region of low precipitation and few surface water supplies. Principal development of groundwater supplies has been for municipal and agricultural uses. A very small amount is used by the grazing industry.

VEGETATION

Introduction

BLM-administered lands in Clark County support vegetation typical of both the Great Basin Biome and the Mohave Desert Biome. The wide variety of plant species is the result of soil types, elevation, exposure, temperature, precipitation, and existing and past use.

Shrubs, or shrubs and trees are the dominant plants of the vegetation communities, on the basis of size, percentage cover, and stable occupancy of the land surface. At the lower elevations, shrubs usually occur in clumps in which the above-ground and below-ground parts of from one to several species live in close association. The shrub clump is the fundamental unit of vegetation in most of the county, each clump representing almost a separate system in itself (Clark County URA 1980). Shrubs are found increasingly less clumped with increases in rainfall, decreases in temperature, and the

change in species composition which accompanies increase in elevation (Beatley 1969).

In addition, most vegetation types contain herbaceous plant species, which fall into two classes:

a. Perennials: Plants that continue growing indefinitely. Some die back to the ground each winter, but revive from the roots the following spring. Most perennials simply add new growth each year, with little loss or destruction of above-ground parts.

b. Annuals: Winter annuals and in some cases summer annuals, are a widely fluctuating component. Growth usually begins with germination following rainfall in the autumn, late winter, or spring. Production from these early species can vary as much as 100 percent from year to year, or area to area (Clark County URA 1980).

Stoddart et al. (1975) asserts that the original southern desert rangelands contained much more perennial grass than today, citing *Muhlenbergia porteri* as a formerly important perennial grass species that has been reduced by grazing.

Regional Overview

Clark County has been classified as Southwest Desert Ephemeral Range since 1968. This classification means that the range does not consistently produce substantial amounts of perennial forage. Rainshowers are often followed by a resurgence of annual (ephemeral) vegetation production. It is this annual production which sustains the bulk of livestock grazing in the county (Clark County URA 1980).

Annual production fluctuates with climatic variations and precipitation patterns. In hot, dry years, the ephemeral vegetation is sparse and dries up in a very short period. In wet years, which occur only sporadically, large quantities of red brome, buckwheat, filaree, indian wheat, and other forbs are produced and may stay green for several months. Production also varies from site to site. This is apparently related to soil conditions and the "spottiness" of fall rainstorms.

Drought years compound the problem of a lack of annual production with a lack of available water. Most of the water in the county is supplied from springs and reservoirs. The quality and quantity of these water sources generally depends on seasonal precipitation, whether in the form of rain or snow. Generally, annual vegetation production and water availability can be considered relatively proportionate.

Native perennial grasses and shrubs, though they may be high in palatability to grazing animals, are generally too sparse to support sustained grazing. The sparseness of perennial forage plants is evident in the low percent they represent in the composition of most vegetation types. Even with increases of perennial plants, most areas would still be incapable of supporting sustained grazing. However, there are a few areas in the county which have the potential to produce perennial forage on a sustained-yield basis.

Vegetation Types

Thirteen major vegetation types and 25 subtypes were identified as a result of the 1979 range survey conducted in accordance with BLM Manual 4412.11 (USDI, BLM, 1968).

The major vegetation types are shown on the Vegetation Map, and are summarized in Table 2-1. Vegetation types were delineated based on the species or various combination of species which appear to dominate the range.

No phenology data has been gathered on public lands in Clark County; however, phenology data has been gathered at the Nevada Test Site for the more common species in this area. Resource specialists used this data, phenology data from neighboring BLM Districts, plus field inspections, to estimate critical growing periods of key vegetation species. Critical periods were from late February to mid-May and vary by one month depending on climatic conditions. Grazing treatments that allow rest or defer grazing during these critical periods would permit key species to generate new growth, produce and disseminate seeds, and improve plant vigor.

Key species are selected because of their palatability to livestock and their ability to increase in the composition of the vegetation community under proper management. The key species which could be used for Clark County are indian ricegrass (*Oryzopsis hymenoides*), big galleta (*Hilaria rigida*), squirreltail (*Sitanion hystrix*), bush muhly (*Muhlenbergia porteri*), black grama (*Bouteloua eriopoda*), mountain mahogany (*Cercocarpus* spp.), cliffrose (*Cowania mexicana stansburiana*), Nevada jointfir (*Ephedra nevadensis*), and bitterbrush (*Purshia* spp.).

Livestock Forage Condition and Apparent Trend

Livestock forage condition refers to the quality of forage of each vegetation type for the class of live-

stock authorized to graze. Range condition is referred to as the current health of the range in relation to its potential to produce forage for livestock under a sustained-yield philosophy. Information for range condition was gathered during the 1979 range survey and determined from the percent composition of desirable, intermediate, or undesirable plants in a vegetation type (see Table 2-2 for relative desirability of some forage plants in Clark County). The 1979 range survey indicated that 89 percent of Clark County is in poor livestock forage condition (3,065,567 acres), 8 percent is in fair condition (414,752 acres), and 3 percent is in good condition (103,696 acres). There are 26,754 acres of rock or waste areas that are unclassified for forage condition. Livestock forage condition is an interpretation of the quality of forage of each vegetation type for the class of livestock authorized to graze on an area.

Apparent trend is a measurement of change in a plant community taken at a single point in time by a visual observation of an allotment and based on (1) the relative occurrence of desirable livestock forage plants and seedlings (usually perennial grasses) in the plant community, (2) vigor of these desirable plants, (3) presence of soil movement and of litter, and (4) presence of plant disease. Currently 94 percent of Clark County is in apparent static trend (3,395,421 acres), 4 percent is in apparent downward trend (126,826 acres), and two percent is in apparent upward trend (61,728 acres) (Clark County URA 1980).

Desert Wash and Riparian Vegetation

Because of the scarcity of water over most of Clark County, riparian vegetation is not plentiful. Riparian areas on public lands in Clark County are associated with springs and two perennial streams, Cold and Willow Creeks. No livestock grazing presently occurs along these two streams.

Overgrazing is almost universally thought to have a severe impact on riparian vegetation (Brown et al. 1977; Ames 1977). Inventories conducted by BLM indicate at least 18 springs in Clark County are being heavily impacted from livestock or wild horse or burro use.

Desert washes are extensive throughout Clark County. Certain desert washes, identified by the presence of such indicator species as tamarisk (*Tamarix gallica*), desert willow (*Chilopsis linearis*), mesquite (*Prosopis juliflora* and *P. pubescens*), and catclaw acacia (*Acacia gregii*), play a unique role with a biological importance out of proportion to their relatively small area (Szaro and Patton 1981). These washes contain higher plant diversity and layering as compared to the surrounding desert.

There are nine major wash areas which are of concern (see Table 1-7). These areas total about 10,000 acres, all of which are currently in poor livestock forage condition. Many smaller unquantified desert washes exist.

WILDLIFE

A wide variety of wildlife species inhabit Clark County. Only those species expected to be significantly impacted by the Proposed Action or alternatives will be addressed in detail. A complete list of the wildlife species, their habitat, and distribution can be found in the Clark County Unit Resource Analysis (URA) (1980).

Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

The Nevada Department of Wildlife (NDW) and BLM have listed the bighorn sheep as a *sensitive species*, warranting special management consideration in BLM planning and decision-making processes. Present population estimates, reasonable number projections, and acres of presently occupied habitat by mountain range are depicted on Table 2-3. Reasonable numbers are mutually developed by NDW and BLM as a statewide cooperative effort and management commitment. Reasonable numbers were derived from an evaluation of habitat and population management potentials assuming other uses of the habitat are managed at a level that does not prohibit bighorn from making full use of the available resources.

Population levels fluctuate slightly from year to year in response to climatic factors. However the long-term trend in sheep populations is stable in all but the Virgin and Gold Butte ranges where an upward trend is anticipated following reintroduction efforts in 1979 and 1980. Potential exists in every range to increase sheep numbers through habitat management. Approximately 639,000 acres of currently occupied yearlong habitat exists in Clark County.

Water is the most significant limiting factor for bighorn populations in southern Nevada. Water restricts the distribution of sheep in summer when water demand is greatest and available water is severely limited. Sheep numbers are restricted by the quality and quantity of forage close to water since

the remainder of the habitat is inaccessible due to distance from water.

Most bighorn remain within two miles of available water in summer (Leslie 1977). There are approximately 144,300 acres of current crucial summer habitat in Clark County, all within two miles of the 54 permanent water sources bighorn are known to use. Crucial habitat is the area upon which an animal is dependent for survival and propagation.

Current yearlong habitat and crucial summer habitat are depicted on the Desert Bighorn Sheep Habitat Map.

Significant conflicts affecting bighorn sheep from livestock and wild horses or burros occur in 11 of the 16 presently occupied bighorn ranges in Clark County (Clark County URA 1981; Janke 1979). Conflicts arise from competition for forage, water, and space.

Livestock competition is most severe during the dry, hot season (May through September) when both cattle and bighorn center their activities around permanent water sources that are essential to both species. Perennial and ephemeral forage in the vicinity of water is of prime importance to both grazers at this time.

Although forage in rugged escape terrain is not accessible to cattle, bighorn and cattle compete for forage on gentle slopes and in washes adjacent to escape cover and water sources. Competition is manifested by bighorn population densities that are lower in areas with livestock grazing than in areas without livestock grazing (McQuivey 1978). Fecal analysis studies conducted by the Las Vegas District, BLM, on the McCullough Mountains found significant dietary overlap between bighorn and cattle during the summer. A preference for grasses was indicated by both cattle (89 percent of diet) and bighorn (88 percent of diet).

Livestock and bighorn need not be in the same area in the same season to compete for forage. Livestock that graze a bighorn crucial area during the growing season can deplete the forage supply before the operator moves them elsewhere, leaving little forage for bighorn in the dry season when they must concentrate their activities near springs.

Competition for water may occur if the water source is accessible to livestock and within one mile of escape cover in bighorn habitat. Sheep may be reluctant to approach water sources when cattle are nearby, and, as a result, livestock concentrations near water may reduce bighorn use (Wilson 1968). Some water sources are inaccessible to livestock; so the water is piped to the livestock, eliminating all or most of the water at the source for bighorn. Other water sources are corralled, preventing sheep use yearlong.

The type of livestock is important also. Cattle are restricted from using some areas due to rugged terrain, but domestic sheep are less restricted. Bighorn are highly susceptible to domestic sheep diseases, further increasing incompatibility (Jessup 1981). In Clark County domestic sheep are licensed in bighorn habitat in the Virgin Mountains (Bunkerville allotment) and in a very small portion of the Newberry Range (Christmas Tree Pass allotment).

Bighorn sheep are extremely sensitive to any competition from other ungulates. Studies done in southern Utah by Wilson in 1968, indicate severe competition for space between bighorn sheep and livestock. Wilson found in Red Canyon that no bighorn sheep use had been evidenced since the introduction of 25 to 30 head of cattle in 1887. Cattle were removed and within six months bighorn sheep reoccupied the canyon. Another study area considered as a home range for a band of bighorn had no livestock use. Thirty heifers were introduced to the area for two weeks. The band of sheep left the area and did not return for eight months. Because of this competition for space, the quantity of forage and water present in an area is not the only consideration when meeting bighorn needs.

The small number of wild horses and the degree that horse and bighorn habitat overlap indicate competition is not considered to be serious at this time, except in the Bird Spring, South Spring, and Red Rock/LaMadre ranges where bighorn and wild horses compete for forage and water at Wilson Tank, Bird Spring, Lone Grapevine Spring, Mud Spring #2, and 99 Spring.

Bighorn and burros can have a high degree of dietary and habitat overlap. Seegmiller and Ohmart (1981), studying bighorn and burro ecological relationships in the Bill Williams Mountains of Arizona, found 47 percent dietary and 51 percent habitat overlap. In the Grand Canyon, dietary overlap was 48 percent, with 80 percent of bighorn sheep observed within the range of burros (Walters and Hansen 1978). In Clark County, significant conflicts between burros and bighorn may exist in the Eldorado, Muddy, and Black Ranges, and may develop in the Gold Butte Range if the bighorn population expands.

Crucial bighorn sheep and desert tortoise (see below) habitat by grazed allotments are shown on Table 2-4.

Desert Tortoise (*Gopherus agassizi*)

The desert tortoise is classified *rare* by the State of Nevada, and *sensitive* by the BLM. Approximately 3,031,400 acres of tortoise habitat exist in Clark

County, of which 486,200 acres are considered crucial. Crucial tortoise habitat contains tortoise densities of 50 or more tortoises per square mile. The threshold at which a tortoise population might drift into an irreversible decline is estimated by Berry and Nicholson (1979) to be any population with a density below 50 tortoises per square mile. See the Desert Tortoise Crucial Areas Map for location. Table 2-5 lists acres of tortoise crucial habitat by grazing allotment.

Low reproductive potential, the long period (15 to 20 years) between hatching and age of first reproduction, low survival of young, low population turnover, dependence on ephemeral and perennial grasses and annual wildflowers for food, and burrowing habits, are characteristics and behaviors of the desert tortoise that make it susceptible to environmental influences resulting from livestock grazing. Livestock, especially where grazing is intensive, have the potential to remove forage, damage or destroy perennial shrubs used for shelter, and crush burrows and small tortoises (Berry 1978; Luckenbach 1982).

Grazing can have a greater impact on adult female tortoises than on males because of the heavy metabolic demands of egg laying. Eggs are laid in late spring and early summer, usually after winter annuals have dried and succulent green forage is no longer available. The spent female may have to wait until the following spring to replenish fat reserves and perhaps a second or third year if there is a drought or continuous competition from livestock for available forage. Thus females recently depositing eggs may be more likely to suffer stress and greater mortality than males of similar size (Berry 1978).

Spring annual forbs and grasses contain the essential nutrients necessary to sustain reproduction (egg production, etc.). Reproduction may be suppressed when these spring annual forbs and grasses are nonexistent or present in insufficient quantity to sustain reproduction, along with the existence of intense livestock competition for the small quantity of annuals that do exist. If suppressed reproduction continues for any extended length of time, a tortoise population, which naturally has low recruitment potential and long maturation periods, could be adversely affected to the point of extinction by insufficient reproduction.

Grazing-induced population declines in tortoises may, therefore, be reflected in the tortoise population by a preponderance of adults, and by sex ratios where males outnumber females (Berry 1978).

Gambel's Quail (*Lophortyx gambelii*)

Gambel's quail, the primary small game species in southern Nevada, occur throughout Clark County, which contains 3,240,300 acres of habitat. Approximately 884,600 acres are crucial summer habitat within 1.5 miles of water.

Estimates of population are extremely variable from one year to the next, dependent largely on climatic conditions, primarily precipitation (Brown 1978). In dry years, numbers may be as low as a few thousand birds, whereas under optimum conditions, several hundred thousand birds may be produced.

Appendix Table C-1 shows how populations fluctuate depending on precipitation. Conflicts with livestock and wild horses and burros presently exist where heavy use by these animals removes desirable quail food and cover around quail waters.

Other Wildlife

Two habitat types, riparian and desert wash, are especially important to wildlife in Clark County. Stream and spring riparian habitat is associated with water, a scarce prerequisite needed to support many wildlife species. Thus many wildlife species occurring in a given area are directly dependent on this habitat, or utilize this habitat proportionately more than any other habitat. Certain desert washes, particularly those dominated by desert willow, mesquite, tamarisk, or catclaw acacia, are significant because more diverse vegetation (both in number of species and degree of layering) provides habitat for higher total numbers of animals and numbers of wildlife species (Bradley and Deacon 1967). This is demonstrated from bird surveys conducted by the BLM Desert Plan Program, Riverside, California (1978) in Piute Valley, California (southern portion of the valley which originates in Clark County, Nevada), which indicate that desert washes in creosote-burrobush communities are utilized to a greater extent than the surrounding creosote-burrobush. Data shows that winter bird densities are 50 to 60 times higher and that spring (breeding) bird densities are 12 times higher in these washes. A greater abundance of some lizards, such as zebra-tailed and leopard lizards, and desert iguana can also be found in these washes (Bradley and Deacon 1967).

Rocky or sandy washes are preferred habitat of gila monsters (State-listed *rare*) (Deacon and Bradley 1965). The lower Colorado River drainage, Moapa and Virgin Valleys, and Meadow Valley

Wash are key gila monster habitat (Nevada Department of Wildlife 1980).

A small population of elk (less than 75 animals) inhabits 173,300 acres in the Spring Mountains. Thirty-two percent of the habitat is located on ungrazed allotments, 47 percent on the Wheeler Wash allotment with cattle grazing, and 21 percent on the Lucky Strike allotment with domestic horse grazing.

Wildlife Funding

Funding for habitat management plan development and implementation in the Las Vegas District for the past several years has been as follows: fiscal year 1979 - $60,000; fiscal year 1980 - $125,000; fiscal year 1981 - $124,000; and fiscal year 1982 (budget) - $60,000. The four-year annual average is $92,125, which represents funds used for HMP work throughout the district. It is anticipated that $60,000 per year is a likely annual project budget for the district, and about $40,000 would be allocated for use in Clark County.

WILD HORSES AND BURROS

Four wild horse and burro herd use areas, comprising approximately 287,000 acres of public lands, are presently recognized in Clark County. Each delineated area constitutes the estimated range of animals within a particular geographic area (see the Wild Horse and Burro Herd Use Areas Map). They are the Gold Butte, Muddy Mountain, Eldorado, and Spring Mountain herd use areas (see Table 2-6 for herd use areas by allotment). In the Spring Mountain herd use area, primary use areas are segregated into seven band areas.

Present numbers for horses and burros in Clark County are estimated at 48 and 827, respectively. Animal unit month (AUM) demand is 576 for horses and 4,962 for burros (see Table 2-6).

The Gold Butte, Muddy Mountain, and Eldorado herd use areas are situated adjacent to the Colorado River and overlap both Bureau of Land Management and National Park Service (NPS) lands. According to the Commission on National Resources in studies reported by O'Farrell (1978), Hanley and Brady (1977), and others, burros tend to congregate near the river, especially during summer months. In the fall of 1981, a cooperative agreement between BLM and NPS established joint management of wild and free-roaming horses and burros where they inhabit BLM and NPS lands; their primary use area was recognized to be within the Lake Mead National Recreation Area during the hot, dry summer months.

Burros in the Gold Butte and Muddy Mountain herd use areas appear smaller than those observed in similar terrain in Arizona and in the Esmeralda Planning Unit (Clark County URA 1981). According to Stovall in the Tassi-Gold Butte Herd Management Area Plan (HMAP) (USDI, BLM, Arizona Strip District, 1981), animals in the Gold Butte herd use area appeared in good general health. Although no age structure information is available, male to female sex ratio is roughly 1:1. The majority of animals in these two herd use areas are gray and possess a shoulder-cross characteristic. Competition between burros and livestock can occur but the abundance of water available in the herd use area appears to prevent burros from ranging too deeply into livestock grazing zones and vice versa.

In the spring of 1981, utilization and trend studies were established on the Gold Butte allotment as part of the Arizona Strip District's HMAP for the Tassi-Gold Butte area. Utilization of burrobush (*Ambrosia dumosa*), one of the most common shrubs in the area, was estimated at an average of 71 percent (heavy). Numerous plants were dying from overutilization. No grazing overlap between burros and livestock was noted (USDI, BLM, Arizona Strip District, 1981). In the Quail Wash area located substantially north of the other study areas, utilization of burrobush was less, at 33 percent (light). It is postulated that this is due in part to a greater density of vegetation occurring in the area. Utilization of range ratany (*Krameria parvifolia*) was also noticeable. Little overlap of burro and livestock use was noted (Stovall, BLM, Arizona Strip District, personal communication, 1981).

No information is available concerning burro diets and utilization of forage in the other herd use areas in the county. Throughout the Mojave Desert, browse exists in greater quantities than grasses for the most part. It appears that where burrobush exists in quantity in Clark County, this species forms the major portion of the burro diet. According to the Death Valley DEIS (1981), other principal browse species might include wolfberry (*Lycium andersonii*), blackbrush (*Coleogyne ramosissima*), spiny hopsage (*Grayia spinosa*), and indigo bush (*Dalea fremontii*).

The Spring Mountain herd use area supports a population of 48 horses and 68 burros. Of the seven bands recognized within this herd use area, three are exclusively horse bands, three are burro bands, and one is composed of both horses and burros. The majority of horses were observed in the area of Blue Diamond and the Red Rock Canyon Recreation Lands. According to the wild horse and

burro inventory files, the majority of burros were observed in the southwestern portions of the herd use area (USDI, BLM, Las Vegas District, 1979). Unlike the herds in the Gold Butte and Muddy Mountain herd use areas, horses and burros in the Spring Mountain herd use area have virtually unlimited movement.

The condition of both wild horse and burro populations in the county appears good, and competition with domestic livestock is minimal (Clark County URA 1981).

LIVESTOCK GRAZING

Clark County is divided into 49 areas (see the Allotment Boundaries Map) which are being, or have been in the past, grazed by livestock (24 each in the Virgin Valley and Stateline Planning Units, and one being the Lake Mead NRA (9999) areas attached to several allotments). Thirty-four of these areas are currently allotted and are being actively grazed by an operator. Seven are allotted but have not been used by the operator since at least 1975 or longer. The remaining eight areas are not allotted and have also not been grazed (see Status on Table 1-1). Of the 34 active allotments, seven are community allotments being used by more than one operator.

There are 44 entities that own base property formerly associated with the 41 allotted grazing areas in Clark County. One is a religious nonprofit corporation, another an Indian tribe, and a third an estate. The other 41 are individuals. Of the 44 operators, 35 have grazed livestock on the 34 active allotments during the past seven years. This number includes the religious nonprofit corporation, the estate, and 33 individuals.

Ten of the 35 active operators hold grazing privileges in more than one Clark County allotment. Twelve of the 35 (including two of the above 10) hold grazing privileges on grazing allotments outside of Clark County.

Under a special grazing rule promulgated by the BLM on December 7, 1968 (*Federal Register* 1968) and applied to all of Clark County, ephemeral range is characterized as generally located below 3,200 feet in elevation; having an annual precipitation of less than five inches; having a minor percentage of the total plant composition made up of desirable perennial forage plants; usually having a history of sporadic grazing use coinciding with seasons of favorable annual forage production; having limited potential for development by vegetation manipulation; and lacking potential to improve condition or to produce a dependable forage supply through intensive management. Ephemeral-perennial range is characterized as lying generally between 3,200 and 4,000 feet in elevation; receiving between 5 and 12 inches of annual precipitation; having a significant percentage, or the potential for a significant percentage, of total composition being made up of desirable perennial forage plants; having the potential to respond to vegetation manipulation techniques; and having the potential to improve condition and produce a dependable supply of perennial forage through intensive management (USDI, BLM, 1968).

Under current ephemeral grazing rules, range inspection prior to licensing is not required. Grazing can be authorized when forage is present or when climatic conditions indicate a likelihood of forage being present in the future.

In Clark County, grazing licenses have been sought and approved during the times shown on Table 2-7. Since all the range is classified as ephemeral, there are no authorized periods-of-use.

TABLE 2-7

CURRENT ALLOTMENT USE PATTERNS IN CLARK COUNTY

Use Period	Number of Allotments
March-May; September-November	8
March-May; November-December	1
March-May; September-January	1
March-May; November-February	1
March-May only	6
May-November	1
Yearlong	16
	34

Source: Clark County URA 1981.

Allotments in Clark County had been both land- and water-based prior to 1968. In the Virgin Valley Planning Unit (northeast of Las Vegas), all but three of the 24 allotments were land-based. Today, of the 19 active allotments in the planning unit, only four are grazed yearlong. In the Stateline Planning Unit, all but one of the 24 allotments were water-based. Today, of the 15 active allotments, all but three are grazed yearlong. (The 49th allotment is represented by the grazed portions of Lake Mead NRA, which are attached to several different allotments.)

Under present management, some range inspection does take place prior to ephemeral licensing. Livestock numbers have been adjusted on different allotments, with reductions going as high as 50 percent, when forage seemed sparser than previous years. In some cases, BLM has required use of different parts of an allotment to take advantage of forage availability and to avoid overusage of other areas.

Many operators have some informal grazing systems established, most often making water available in different parts of the allotments at different times of the year. On only one allotment, Crescent Peak, is there a formal system of pasture usage established. That allotment has had an allotment management plan for several years.

Domestic livestock operations on public range in Clark County are the cow/calf or ewe/lamb type. In the first situation, the operator runs a base breeding herd of cows and bulls. The cows produce a calf crop each year. Some heifer calves are retained from each crop for breeding herd replacement. The balance of the crop is marketed, along with old or non-productive cows (culls) and bulls. Calves are usually sold when they reach market size (usually between 6 and 14 months). Operators are not charged a grazing fee for suckling calves. Fees are charged for calves over six months, when their forage consumption is deemed to have become significant. Most operators in Clark County do not establish a breeding season; bulls and cows are together yearlong. The ewe/lamb operation is an identical business. Two operators run horses exclusively.

Livestock Funding

Part of the BLM's range management program involves range improvements (RI). These include such projects as wells, fences, corrals, water pipelines, and vegetation manipulations. The objective of such improvements is to improve range and forage condition by better control of livestock grazing.

Funding for such projects comes from five sources: grazing fees returned to the district for range improvements (RI) (25 percent); grazing fees returned to the county for RI (12.5 percent); grazing fees given to the Secretary of the Interior for RI (25 percent); Public Rangeland Improvement Act (PRIA) monies; and range user contributions. PRIA monies have not been appropriated to the Las Vegas District to date. The Secretarial portion of the grazing fees has also not been specifically identified as coming to Las Vegas. Range users have made contributions of labor or materials in the past. The 37.5 percent of grazing fees returned are readily identified as having been made available.

Using the five-year annual average of AUMs harvested in Clark County of 30,856 AUMs (see Table 1-1), at an average grazing fee over the same period of $1.48 per AUM, the expected grazing fee return (37.5 percent) would amount to $17,125 annually. This is the amount of range improvement funds likely to be available annually.

SOCIOECONOMIC ENVIRONMENT

The overall socioeconomic environment of Clark County is extensively displayed in the following three documents, which are incorporated in this EIS by reference.

1. "Clark County Planning Area Analysis." U.S. Department of the Interior, Bureau of Land Management, Las Vegas District. May, 1981.

2. "Comprehensive Plan for Clark County, Nevada. Task One-Existing Conditions." Clark County Department of Comprehensive Planning, Las Vegas, Nevada. August, 1981.

3. "Socioeconomic Impacts Associated with the Harry Allen Station in Southern Nevada (Contract YA-512-RFP6-103)" Chapter 2. Prepared by Eyring Research Institute, Provo, Utah, for the U.S. Department of Interior, Bureau of Land Management, Denver Service Center, Denver, Colorado. December, 1976.

All three documents are available at the Las Vegas District Office, Bureau of Land Management, and other document repositories in northern and southern Nevada.

ECONOMICS

Introduction

The major industry in Clark County is gaming. It directly produces 34.8 percent of the personal income (State of Nevada 1980) and employs 32 percent of the county workforce (Nevada Employment Security Department 1981). Other major economic sectors, including construction, retail businesses, state and local governments, transportation, and utilities, account for an additional 39.7 percent of the total county employment (Nevada Employment Security Department 1981).

Less than 0.2 percent of the total county personal income is derived from all forms of agriculture, including dairy and non-livestock enterprises, with less than 0.03 percent of the county personal income derived from ranching (Clark County PAA 1981). Thirty-five individuals or companies are dependent either wholly or partially on income from ranching enterprises in the county. Ranching in Clark County produces less than 1 percent of total livestock sold in Nevada (Nevada Crop and Livestock Reporting Service 1979). Consequently, no management alternative, including the No Livestock Grazing alternative, would significantly impact any sectoral industry (agriculture, construction, etc.) nor would it significantly impact county or regional income levels.

The only groups of individuals that could be directly and significantly impacted, economically, by decisions resulting from any of the five alternatives are licensed bighorn sheep guides and ranchers. Typically, individuals in both groups have employment in addition to those enterprises utilizing public lands in Clark County. The dependency upon income from ranching or bighorn hunting varies widely between individuals and fluctuates significantly from year to year.

Each enterprise is a unique operation and may not fit the mold of "typical" with any degree of reliability. However, the need to protect confidentiality requires the concept of typical ranch and ranch budget to be used.

Ranchers will be grouped into three categories based on size of herd as follows:

1. Small - less than 50 animals

2. Medium - 51 to 125 animals

3. Large - 126 or more animals

The licensed bighorn sheep guides in Clark County are all small operations and no division or grouping is warranted.

Rancher Economics

The breakdown for individuals in each category is as follows:

1. There are 17 individuals operating small ranches. Twelve of these ranchers utilize BLM-administered allotments in Clark County for six months or less. The number of animals ranges from 8 to 50 per herd.

2. There are 14 individuals operating medium ranches. Twelve of these operators, two of whom graze on those allotments administered by the Arizona Strip District, graze on BLM-administered allotments in Clark County for six months or less. The other two (of the 14) graze for longer than six months.

3. There are four individuals or companies operating large ranches. All operators in this class are dependent upon public lands for practically all forage needs. Two-thirds of all livestock produced on BLM-administered allotments in Clark County are in this class. Herd sizes range from 193 animals to 725 animals. Two operations in this class employ four full-time employees.

4. Eleven holders of formerly recognized base property are presently inactive and are not categorized by size of ranch.

Ranch Budgets

Small Ranches - The primary source of income to the family is from non-ranching sources or outside employment. The ranching enterprise provides some secondary income or other forms of economic or social returns. A certain level of expense is incurred regardless of how small the number of animals in the herd is. This causes many of the expenses normally considered to be variable costs to become fixed costs, i.e., regardless of how many animals are in the herd, a rancher must make a certain number of herding trips to protect his investment. This creates a rather flat cost level, and only income varies significantly with changes in the number of animals allowed to graze on public lands. An analysis using standard BLM procedures shows that this class of rancher consistently loses money and it is apparently unreasonable for such an individual to continue in business. However, the normal analysis omits the following important factors the rancher probably considers in his evaluation of ranching:

1. In many cases a BLM-administered allotment is part of a total package that is either purchased or inherited. There exists an opportunity to reap profits by utilizing this asset. A typical rancher is interested primarily in cash flow and not net profit. He does not include non-cash income, e.g., depreciation and family or operator labor.

2. In many cases the rancher would own many of the assets needed on his operation, e.g., autos, horses, horse trailers, etc., even if he did not have his BLM permit; therefore, his ranching operation spreads his fixed costs over more units of income.

3. The ranching "business" may allow the rancher to deduct as business expenses many items (e.g., auto expense, depreciation, capital investment credits, etc.) that return him income taxes paid from other sources. Many of these expenses would be incurred at basically the same level regardless of

his ranching opportunity, but his ranching business allows him to recover some taxes.

4. In many cases the operator's livestyle and recreational activities are combined with his ranching operation. He does not demand a high rate of return from these hours, therefore, a typical ranch budget assessing him large quantities of time at minimal wages is unrealistic.

These and other social and economic values cannot be quantified for an economic model; therefore, an individual may be acting rationally, when a typical ranch budget indicates that the person is losing money continually at present or even increased levels of herd size.

Medium Ranches - Most of the individuals in this class also have income from sources other than ranching. Ranches in this class seem to have distinct fixed and variable costs. Therefore, as the number of animals in a herd are increased or decreased, both the income and expenses will likewise change, but in different amounts. The typical ranch operation in this class with a herd of 116 animals has an annual income of $21,779 and annual cash expenses of $17,520. A positive net cash income before depreciation and operator labor is $3,879. The net return on capital and labor is $1,813 (see Appendix Table D-1).

The rancher in this group shows a positive cash flow. The analysis of other noneconomic factors described in the analysis for a typical small ranch seem to apply to this class, also. Therefore, the key factor for analysis seems to be net cash flow.

While the estimated absolute values of annual income and expenses vary considerably between the two analyses, the resulting cash flow seems to be about the same as described in both the Shivwits grazing EIS (USDI, BLM, Arizona Strip District, 1979) and the MX study by Resource Concepts, Inc. (1981); therefore, an average of the two studies will be used to approximate the existing budget for a typical ranch operation with 116 animals. These two studies in neighboring areas seem to be adequate to estimate impacts to the economic situation. Appendix Table D-2 presents a typical ranch budget (per-unit costs) for a medium-sized operation.

Large Ranches - Many studies (e.g., Gray 1970, Workman 1979) indicate that a ranching operation should have a minimum of 300 brood animals to be an economically self-sufficient operation. Ranches in this class approach or exceed the base required in these studies. These operations show positive cash flows and, in the Caliente ES (1979), show a positive net profit. These operators have apparently reached sufficient size to obtain economies of scale. The Caliente ES and an MX study (Resource Concepts, Inc. 1981) differ in size of input on ranch management and economics, but they approximate the same cash flow; therefore, an average of the two studies will be considered representative of the typical ranch budget for large ranches in Clark County (see Appendix Table D-2). Ranches in this category have distinct fixed and variable costs. These operators show a positive cash flow of $12,089. Even with depreciation subtracted, the operators show a return of $3,871 on capital and labor investment. It is only when an operator's labor is calculated and subtracted that the operation becomes unprofitable. It would appear that much of the same rationale regarding why a small rancher remains in a business when "typical" ranch budgets show continual losses would also apply to large ranches.

Rancher Wealth

The Bureau of Land Management does not consider grazing permits as real property, since a grazing permit is revocable. Historically, however, grazing privileges have been bought and sold along with the tangible assets in a ranching operation. Ranchers have been willing to pay extra for an operation that has grazing privileges on public lands, indicating acquired market value (Vale 1979, Neilson and Workman 1971). The market value of an AUM is usually higher in northern Nevada than in southern Nevada, because of higher range productivity. Current AUM values in Nevada range from $25 to $60 per AUM (Paradise-Denio EIS 1981). At an average price of $25 per AUM and using a five-year average of AUMs licensed, the market value of privileges in Clark County would range from $1,325 (the smallest use other than none) to $247,750 (the largest use). The total value of ranch AUMs is $771,400. While these values are insignificant to the total value of all real and personal property in Clark County, they could be significant to individuals.

Wildlife Economics

The total visitor-day use for 1980 in Clark County for recreation on public lands was estimated at 3,787,034 days, with a capitalized value of over $155,000,000 (Clark County PAA 1981). This represents the value of all recreational activities, including hiking, off-road-vehicle activities, picnicking, hunting, rockhounding, and others. A major demand now and in the future for BLM lands will be for recreation. A major conflict between recreation and livestock grazing is in the area of recreational activities focusing on wildlife.

The only current measurable consumptive use of bighorn sheep or small game animals is hunting. This should not be construed to indicate that this is the only value of these animals. Rather, it is the only activity for which numbers are kept and compiled. Therefore, calculations for economic analysis estimate only one use for a portion of all wildlife. Insufficient data about other activities (e.g., sightseeing, photographing) preclude that analysis, and therefore the wildlife economic values would be greater than those stated.

Desert Bighorn Sheep

Forty-five bighorn sheep tags were issued for hunting areas in Clark County on public lands administered by BLM. An additional 30 tags were issued for areas in Clark County administered by the U.S. Fish and Wildlife Service. Of all the bighorn tags available in Nevada, 84 percent are issued in Clark County.

There are nine licensed bighorn sheep guides in Clark County (Gibbs, NDW, personal communication, 1981) who realize direct family income from bighorn sheep hunting.

The current ratio of guides to hunters is one guide for every eight and one-third tags. Based on this ratio, five hunting guides rely on income from bighorn sheep hunting on BLM-administered lands in Clark County. (The balance of this analysis will assume that the number of guides will remain at the present ratio.)

The number of hunters per season, the fees charged, the guide's past reputation, and the equipment and vehicles owned, all make it impractical to estimate the net income from guiding bighorn sheep hunts. Since impacts are only to the individual and vary so widely within the profession, no typical budget will be projected.

Like the small rancher, the guides and the scope of their operation varies between individuals and fluctuates annually. Much of the same rationale that supports a small rancher staying in business applies to the guides. Other non-income determinants play a major role in the person's rationale for entering, staying, or exiting the business. In addition, Nevada Department of Wildlife regulations and licensing policies, plus the individual's prior success record, can have major impacts upon the guide business. It is impractical to estimate projection of income with so many uncontrolled variables. After all costs, including non-cash costs, have been calculated, the guide may show a loss. Since the bighorn sheep hunting season is short (one month) and since it is the only major big game species hunted in the area, this activity will never be more than an opportunity for part-time enterprise.

Small Game

The major hunting activity in Clark County is centered on small game, primarily quail, rabbit, and dove. Appendix Table C-1 shows the amount of hunting and the estimated value of small game hunting for the period from 1961 through 1980. The number of hunter-days attributed to small game is directly related to the amount of precipitation, which is the major variable in determining the number of small game animals. While the amount of rainfall is beyond BLM management, forage allocation and improved availability of man-made water sources during drought periods can maintain the trough of normal fluctuations at a much higher level. The twenty-year-average annual value of this hunt is $903,900. The five-year-average annual value for dry years is $307,300, and the five-year-average annual value for wet years is $1,495,000.

The other major income from wildlife is fur harvest. The total value of the 1979-80 fur harvest was over $150,000 (Clark County PAA 1981). Most of the furs are from predators, such as coyote, bobcat, and fox, and their numbers usually follow those of the small game animals. No analysis of economic results are calculated since many variables other than BLM management of habitat affect their numbers and harvest.

SOCIAL PROFILE

Clark County accounts for 58 percent of the total population for the State of Nevada. The metropolitan area of Las Vegas, including Henderson, Boulder City, and North Las Vegas, has 454,769 persons while the remaining rural areas have 7,047 persons (U.S. Department of Commerce 1980). In a recent local newspaper article (Vogel 1982), the population of the county was estimated to have reached a half-million.

Clark County has an overwhelmingly urban population. Nearly 98.8 percent of the residents are concentrated in the Las Vegas Valley and Boulder City. On the other hand, the rural population of the county, although small, is distinctive in its life styles and its attitudes.

The county and its people can be divided into four distinct communities:

Moapa-Virgin River Valley: This is a rural, agriculturally-oriented area. The agriculture base is principally dairy farming and alfalfa production. Of the 31 operators holding permits in the Virgin Valley Planning Unit, 20 reside in Virgin River Valley communities. Of the others, three are Las Vegans and

seven are Utahans. The religious institution, which has a permit here, has a significant following in these communities.

Las Vegas and Government-Installation-Oriented Communities: These are represented by small towns to the west and northwest of the city: Blue Diamond, Mountain Springs, Mount Charleston, and Indian Springs. The first three are less than an hour's drive from the city. Each provides a setting relatively isolated from the urban hustle of Las Vegas. Mountain Springs and Mount Charleston, in particular, are noteworthy for their sylvan surroundings, an ambience much prized in the desert. Indian Springs provides a close-at-hand residence for Nevada Test Site and Indian Springs Air Force Base employees. Although each community has a base of residents involved in the town itself, these areas are very attractive to Las Vegans seeking country residences.

Service Communities: The southern tier of communities, Goodsprings, Jean, Nelson, Searchlight, and Laughlin, seem to be most strongly oriented toward services, particularly recreational. Jean provides roadside services and gaming to Las Vegas-bound travelers. It also offers a base to desert recreationists. Laughlin is organizing itself to become a major gaming destination for Arizonans by expanding both the community and the existing casinos. Searchlight has been a central service community at the state's southern tip since the days of the highly active Searchlight Mining District. It still retains the independent spirit of the early prospectors who made it go originally. Of the 13 operators in the Stateline Planning Unit portion of the county, three live in Searchlight and two in Jean. Two of those three Searchlight operators can be considered community influentials and one of the two can be considered a regional and national influential in the livestock industry.

Urban Las Vegas (Las Vegas, North Las Vegas, Henderson, Boulder City, and metropolitan Clark County): Seen by many outsiders as only an impersonal gaming capital (the Strip and Downtown), Las Vegas is in fact two communities: the gaming establishment and, behind that facade, a very normal, residential community with much the same interests and drives as comparable communities (Eyring 1976). It is an expanding community, with one of the highest growth rates in the country. Providing the appropriate environment to encourage and accommodate that growth is a basic thrust of urban Las Vegas. Only Boulder City, of all the urban communities, has moved legislatively to moderate its natural growth rate.

Four of the 13 Stateline Planning Unit permittees and three of the 31 Virgin Valley Planning Unit permittees reside in urban Las Vegas.

The Eyring Research Institute study (1976, pp. 34-39) discusses the cultural values and beliefs that characterize Clark County as these values and beliefs are perceived by the opinion leaders interviewed. County-wide, a high importance was given to *economic development* and *industrial growth and expansion*. Overall, more traditional values such as *hard work, religion,* and *community cohesion* rated somewhat below the first two. However, when responses from rural and metropolitan opinion leaders were separated and compared, there were radical differences. Metropolitan leaders emphasized *economic development, industrial growth,* and *material comfort,* while rural leaders strongly de-emphasized them. Conversely, *the family, neighborliness, honesty,* and *trust* were highly rated values for rural leaders, but given less relative emphasis by urban opinion leaders.

Attitudes toward public land management among urban Las Vegan residents do, and will continue to, vary greatly. It is routine for BLM employees, in public forums and in discussions with local citizens, to encounter the entire spectrum of national opinions on public land and natural resource management. This diversity of opinion is traceable to the fact that Las Vegans look to the public lands largely to satisfy their immediate recreational needs. These run the gamut of activities from nonconsumptive, such as hiking and camping, to consumptive, such as hunting.

Hunting is a recreational activity of great interest, with particular attention being given to the desert bighorn sheep. It is a prize trophy and the official animal of the State of Nevada. The lore of the animal has caused several local groups to be organized to support actions to improve the population. Management of the animal and its habitat, particularly if not supportive of population improvement, would generate immediate and strong expressions of concern.

The desert tortoise is an animal of increasing concern to many citizens. Some professional biologists have championed its cause for some time. To an unknown degree, the animal has become a "backyard pet" of many Las Vegans. Those domesticating the desert tortoise have formed at least one citizens' group. They may serve as the locus of a surge of public interest concerning the wild animal.

Wild horses and burros get mixed reactions from Las Vegans. In some quarters, the animals are fully championed, to the exclusion of any human management or any other use. They are perceived in those quarters as a natural inhabitant of the public lands, warranting at least the same considerations given wildlife. Other groups/individuals see them as an introduced, aggressive species which alters its

range to the significant detriment of certain resource values (e.g., springs, riparian habitat, vegetation) that those groups/individuals prize.

Livestock grazing of the public lands in Clark County, in itself, is not an issue of great moment in Las Vegas. However, the community and its principal industry, gaming, have strong self-image links with romantic western themes. Horses, western garb, and ranchettes are important elements of the lifestyle of the off-the-Strip community. In addition, many in the community will credit the success of this desert community to the attitudes of independence and self-reliance flowing from that western tradition.

In rural Clark County, particularly in the Moapa-Virgin River Valley and the service communities, the attitude toward public land management lies nearer to the natural resource use pole than the resource preservation one. The community memory of the struggle in the late 19th and early 20th centuries to reclaim the land for agriculture or to extract the valuable minerals of southern Nevada is still very much alive. Many of the older residents are the immediate children of those pioneers. The current generation perceives itself as the repository and transmitter of those values which made the pioneering successes possible.

Many residents of these areas would describe themselves as good husbanders of the land. They are concerned that natural resource values be preserved, but they would express confidence that the values can be preserved alongside production useful to and needed by the community.

Attitudes of ranchers in the county are described in the Clark County PAA (1981) as largely reflective of those of ranchers throughout Nevada. Those, in turn, are described in the Caliente ES (1979). At the time of that writing, the CRMP process initiated in Lincoln County (Caliente) was just moving into high gear. While the other observations of the PAA and the Caliente ES regarding rancher attitudes remain valid, their perception of themselves as unlistened-to in the BLM decision-making process should be waning (Clark County PAA, 1981, p. 24). The key social consideration, as evidenced by the preceding Economics discussion, is the ranching lifestyle. Clark County operators, in particular, ranch for reasons other than the economic return.

An important value, in the context of this analysis, is a very strong willingness of Clark County residents to discuss issues constructively with opponents. In almost all cases, where southern Nevada representatives of opposing viewpoints on natural resource management have been given effective forums in which to work, a very positive dialogue has taken place. The Southern Nevada Conservation Council was one such vehicle. Citizens Alert and the No-MX group are two more recent examples of normally antagonistic groups of Nevadans coalescing to attain a common goal. As this EIS is being prepared, a group of more than 30 southern Nevadans from many different interest groups concerned with public land management, has successfully begun an ORV CRMP to provide recommendations to the Bureau on off-road vehicle (ORV) use on the public lands in the county. There are numerous other past examples of such non-polarized dialogue among the Las Vegas District, other agencies, and interested citizens.

TABLE 2-1

VEGETATION TYPES IN CLARK COUNTY

Vegetation Type	BLM Manual Code #	Vegetation Subtype	Acreage	Percent of Total Area	Average Precipitation (Inches)	Associated Species(1)
Grass	012	Mid-Grass (Bunch)	6,788	<1	4-8	blue grama, galleta grass, squirreltail, indian ricegrass
Perennial Forb	031	Perennial Forbs	4,455	<1	8-16	globemallow, wild buckwheat, rabbitbrush, bursage, winterfat, ephedra
Sagebrush	041	Big Sagebrush	3,601	<1	8-12	big sagebrush, rabbitbrush, fringed sage, black sagebrush, blue grama, galleta grass, cliffrose, spiny hopsage, winterfat
	045	Rabbitbrush	6,573	<1		
Mountain Shrub	053	Ceanothus	6,632	<1	8-16	oak, serviceberry, cliffrose, mountain mahogany, indian ricegrass, grama, spiny hopsage
	056	Mountain Mahogany	323	<1		
	059	Other Mountain Shrub	2,290	<1		
Conifer	062	Ponderosa Pine	1,380	<1	>16	ponderosa pine, cliffrose, bitterbrush, sagebrush
Pinyon-Juniper	091	Pinyon-Juniper	20,730	1	8-16	pinyon, juniper, sagebrush, cliffrose, bitterbrush, blue grama, galleta grass, squirreltail, bush muhly
	092	Juniper	90,347	3		
	093	Pinyon	186,436	5		
Broadleaf Trees	102	Oak	1,481	<1	>16	oak, ash, manzanita, cliffrose, ceanothus, blue grama, galleta grass, bush muhly
Creosotebush	111.	Creosotebush	2,006,422	56	4-8	creosotebush, bursage, range ratany, big galleta, indian ricegrass, burrobrush
Mesquite	121	Mesquite	5,138	<1	4-8	catclaw, mesquite, galleta grass, dalea
Saltbush	131	Shadscale	24,955	1	4-8	shadscale, fourwing saltbush galleta grass, sacaton, ephedra range ratany, winterfat
	134	Fourwing Saltbush	3,201	<1		
	135	Other Saltbushes	7,783	<1		
	136	Desert Saltbush	4,339	<1		
Desert Shrub	161	Blackbrush	226,397	6	4-8	blackbrush, joshua tree, bursage, catclaw, ephedra, snakeweed, range ratany, galleta grass, indian ricegrass spiny hopsage, horsebrush, winterfat
	163	Joshua Tree	230,247	6		
	164	Other Desert Shrub	574,314	16		
	167	Bursage	147,778	4		
	168	Catclaw Acacia	8,683	<1		
Half Shrub	171	Snakeweed	10,708	<1	4-8	snakeweed, indian ricegrass, shadscale, galleta grass
Annuals	183	Annual Forbs	3,014	<1	4-8	cheatgrass, Russian thistle, winterfat, wild buckwheat
			3,584,015			

(1) Relative desirability of these plants as forage is indicated in Table 2-2.

Note: There are 26,754 acres recorded in the 1979 Range Survey as barren: code #084, Rock Outcrop, or code #087, other.

Source: Clark County URA 1981.

TABLE 2-2

DESIRABILITY BY GRAZING ANIMALS
OF COMMON FORAGE PLANTS IN CLARK COUNTY

Common Name	Scientific Name	Desirability(1) Cattle Horses	Sheep	Burros
Grasses				
Blue Grama	Bouteloua gracillis	D	D	D
Galleta Grass	Hilaria jamesii	D	I	D
Big Galleta	Hilaria rigida	D	I	D
Squirreltail	Sitanion hystrix	D	I	D
Indian Ricegrass	Oryzopsis hymenoides	D	D	D
Bush Muhly	Muhlenbergia porteri	D	D	D
Forbs				
Globemallow	Sphaeralcea ambigua	I	I	D
Wild buckwheat	Eriogonum spp.	U	U	I
Shrubs				
Rabbitbrush	Chrysothamnus viscidiflorus	U	U	U
Bursage, Burrobush	Ambrosia dumosa	U	U	I
Winterfat	Eurotia lanata	D	D	D
Mormon Tea, Nevada Jointfir	Ephedra nevadensis	D	D	D
Big Sagebrush	Artemisia tridentata	U	U	U
Black Sagebrush	Artemisia nova	U	I	I
Cliffrose	Cowania mexicana stansburiana	D	D	D
Spiny Hopsage	Grayia spinosa	I	I	D
Serviceberry	Amelanchier spp.	I	D	D
Mountain Mahogany	Cercocarpus spp.	I	D	D
Bitterbrush	Purshia glandulosa	D	D	D
Creosotebush	Larrea divaricata	U	U	U
Range Ratany	Krameria parvifolia	U	I	D
Catclaw Acacia	Acacia greggii	U	U	I
Mesquite	Prosopis spp.	U	U	I
Dalea	Dalea fremontii	U	U	U
Shadscale	Atriplex confertifolia	I	D	I
Fourwing Saltbush	Atriplex canescens	D	D	D
Snakeweed	Gutierrezia spp.	U	U	U
Blackbrush	Coleogyne ramosissima	U	U	U
Ceanothus	Ceanothus spp.	I	I	D

(1) Depicts the desirability rating for plant species in Clark County as forage.
D - Desirable
I - Intermediate
U - Undesirable

Source: Cattle, Horses, Sheep - USDA, Forest Service. 1937. Range Plant Handbook.
Burros - USDI, BLM, Las Vegas. 1975. Forage Value Tables, District Range Files.

TABLE 2-3

DESERT BIGHORN SHEEP POPULATION ESTIMATES AND PROJECTED REASONABLE NUMBERS IN CURRENT HABITAT IN CLARK COUNTY

Mountain Range	Map Symbol	Allotment	Acres of Yearlong Habitat	Acres of Crucial Summer Habitat(1)	Current Estimated Number of Animals	Projected Reasonable Numbers (2) of Animals
Highland	BY-1	McCullough Mtn.	21,326	4,579	61	167
		McCullough Mtn.	25,728	8,660		
		Jean Lake	52,767	9,036		
		Hidden Valley	30,281			
McCullough	BY-2		108,776	17,696	160	850
Eldorado	BY-3	Ireteba Peaks	65,879	12,708	120	515
		Newberry Mtn.	20,986	9,451		
		Christmas Tree Pass	5,702	717		
Newberry	BY-4		26,688	10,168	86	209
New York/ Castle/Piute	BY-5	Crescent Peak	20,239	12,290	25	158
		Spring Mtn.	14,894	4,214		
		Table Mtn.	4,216	132		
Bird Spring	BY-6		19,110	4,346	(3)	150
		Spring Mtn.	22,792	3,218		
		Black Bottle	3,866			
		Roach Lake	2,788			
		Table Mtn.	28,588	3,190		
South Spring	BY-7		58,034	6,408	50	454
		7777 (Las Vegas Valley)	13,502	421		
		Spring Mtn.	32,630	26,015		
		Kyle Canyon	19,125	901		
Red Rock/La Madre	BY-8		65,257	27,337	158	510
River	BY-9	6666	10,301	(4)	74	81
		Muddy Mtn.	19,727	12,615		
		White Basin	32,578	14,060		
Black	BY-10		52,305	26,675	306	409
		Muddy Mtn.	48,775			
		White Basin	31,269	2,926		
Muddy	BY-11		80,044	2,926	102	626
		Dry Lake	7,778			
		Pittman Well	11,245			
		Ute	9,749			
		Arrow Canyon	23,784			
Arrow Canyon	BY-12		52,556	(5)	104	411
		Billy Goat Peak	12,331	5,738		
		Bunkerville	7,360	7,360		
		Hen Spring	1,403	1,344		
		Lime Spring	1,512	1,379		
Virgin	BY-13		22,606	15,821	32	183
Cold Butte	BY-14	Cold Butte	16,183	3,350	10	127
Mormon	BY-15	Upper Mormon Mesa	4,065	(6)	14	32
		Arrow Canyon	2,501			
		Acton-Farrier	13,158			
Meadow Valley	BY-16		15,659	(7)	14	128
		TOTAL	639,028	144,304	1,316	5,010

(1) Crucial habitat is that area within a two-mile radius of permanent water sources that bighorn are known to use.

(2) Reasonable numbers are considered by the Nevada Department of Wildlife as long-term averages or goal levels that could be achieved through proper management techniques.

(3) Accurate inventory data is not presently available for the Bird Spring Range.

(4) Bighorn migrate onto the National Park Service portion of the River Mountains for the summer months.

(5) Bighorn migrate to the Meadow Valley Range in Lincoln County or to the Desert National Wildlife Range for the summer months.

(6) Bighorn migrate to the northern end of the range, in Lincoln County, for the summer months.

(7) Bighorn migrate to the northern end of the range, in Lincoln County, or to the Desert National Wildlife Range, for the summer months.

Source: Clark County URA 1981.

TABLE 2-4

CRUCIAL WILDLIFE HABITAT WITHIN GRAZED ALLOTMENTS
IN CLARK COUNTY

Allotment	Crucial Desert Tortoise Habitat (Acres)	Crucial Bighorn Sheep Habitat (Acres)
Aeton-Farrier	39,565	
Arrow Canyon	25,616	
Billy Goat Peak	16,981	5,738
Bunkerville	28,408	7,360
Christmas Tree Pass	46,149	717
Crescent Peak	31,077	12,290
Dry Lake	23,324	
Gold Butte	27,799	3,350
Hen Springs		1,344
Ireteba Peaks	27,762	12,708
Jean Lake	4,117	9,036
Lime Springs		1,379
McCullough Mountain	6,853	13,239
Muddy Mountains	48,132	12,615
Table Mountain	9,633	3,322
Upper Mormon Mesa	46,494	
White Basin		16,986
	381,910	100,084

Source: Clark County URA 1981; Clark County EIS Team 1981.

TABLE 2-5

DESERT TORTOISE CRUCIAL HABITAT
IN CLARK COUNTY

Desert Tortoise Crucial Area (Map Symbol)	Allotment	Acreage of Crucial Area
	Aeton-Farrier	39,565
	Arrow Canyon	25,616
	Glendale	22,353
	Rox	21,736
	Upper Mormon Mesa	46,494
Moapa (CDT-1)		155,764
	Dry Lake	23,324
	Pittman Well	22,208
Arrow Canyon (CDT-2)		45,532
California Wash (CDT-3)	Muddy Mountain	48,132
Riverside (CDT-4)	Bunkerville	3,661
	Billy Goat Peak	16,981
	Bunkerville	24,747
	Gold Butte	9,546
Virgin Mtns. (CDT-5)		51,274
Horse Springs Wash (CDT-6)	Gold Butte	18,253
Red Rock (CDT-7)	Spring Mountain	32,595
Goodsprings (CDT-8)	Table Mountain	9,633
Sheep Mountain (CDT-9)	Jean Lake	4,117
Eldorado Valley (CDT-10)	McCullough Mountain	6,853
	Christmas Tree Pass	46,149
	Crescent Peak	31,077
	Ireteba Peaks	27,762
	Newberry Mountains	5,440
Piute Valley (CDT-11)		110,428
	Total	486,242

Source: Clark County URA 1981.

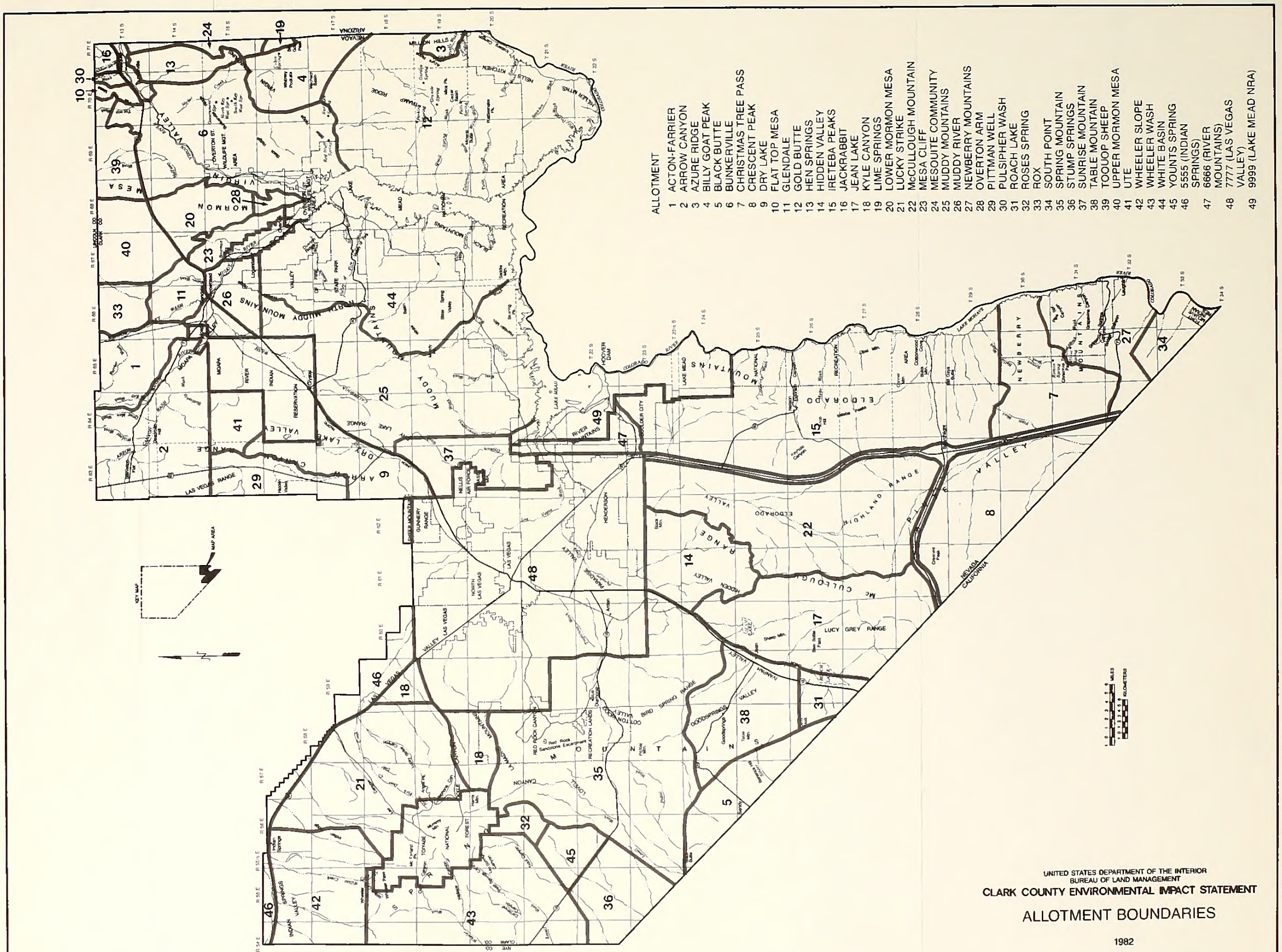
TABLE 2-6

WILD HORSE AND BURRO NUMBERS AND DEMAND(1)
IN CLARK COUNTY

Primary Herd Use Area(2)	Acreage	No. of Horses	AUM Demand	No. of Burros	AUM Demand	Allotments
Gold Butte (B)	128,403	-	-	498(3)	2,988	Gold Butte Azure Ridge
Muddy Mountain(B)	32,769	-	-	122	732	White Basin
Eldorado (B)	53,064	-	-	139	834	Ireteba Peaks
Spring Mountain		48	576	68	408	
Band 1 (H)	14,553					Spring Mountain
Band 2 (B)	7,425					Spring Mountain
Band 3 (H,B)	10,197					Spring Mountain
Band 4 (B)	13,167					Spring Mountain Roses Spring
Band 5 (H)	4,554					Spring Mountain
Band 6 (H)	14,454					Kyle Canyon Lucky Strike
Band 7 (B)	8,712					Wheeler Wash Wheeler Wash
TOTAL	287,298	48	576	829	4,962	

(1) Existing numbers and demand are projected to 1983, the time of decision for this EIS, from 1979 inventory data. See Appendix B for the method of calculating existing numbers.
(2) H = Wild Horses; B = Wild Burros.
(3) This population figure was drawn from more recent inventory data in the Tassi-Gold Butte Herd Management Area Plan (U.S. Department of Interior, Bureau of Land Management, Arizona Strip District, 1981, by Scott W. Stovall).

Source: Clark County URA 1981; Clark County EIS Team 1981.



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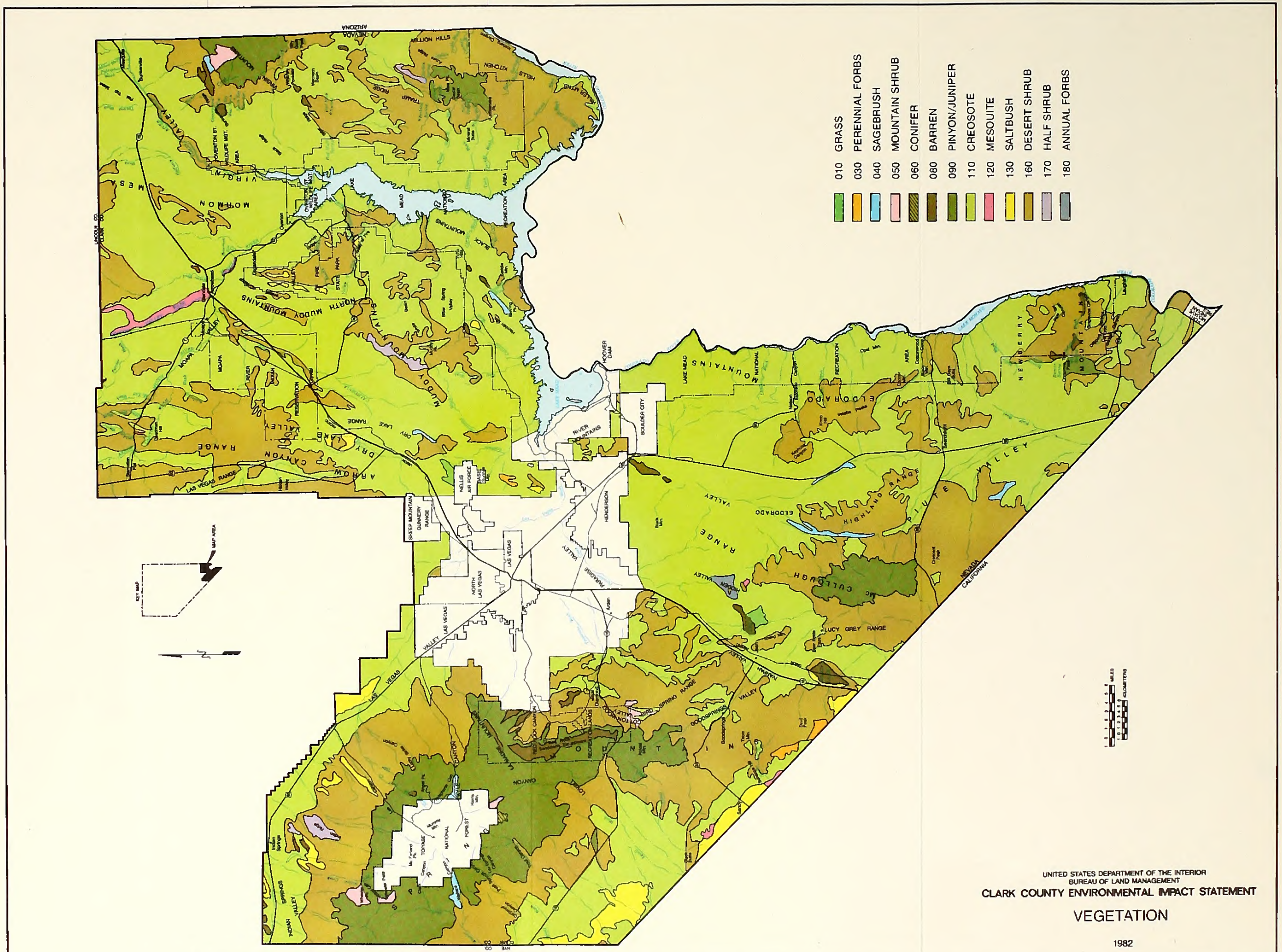
CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT

ALLOTMENT BOUNDARIES

1982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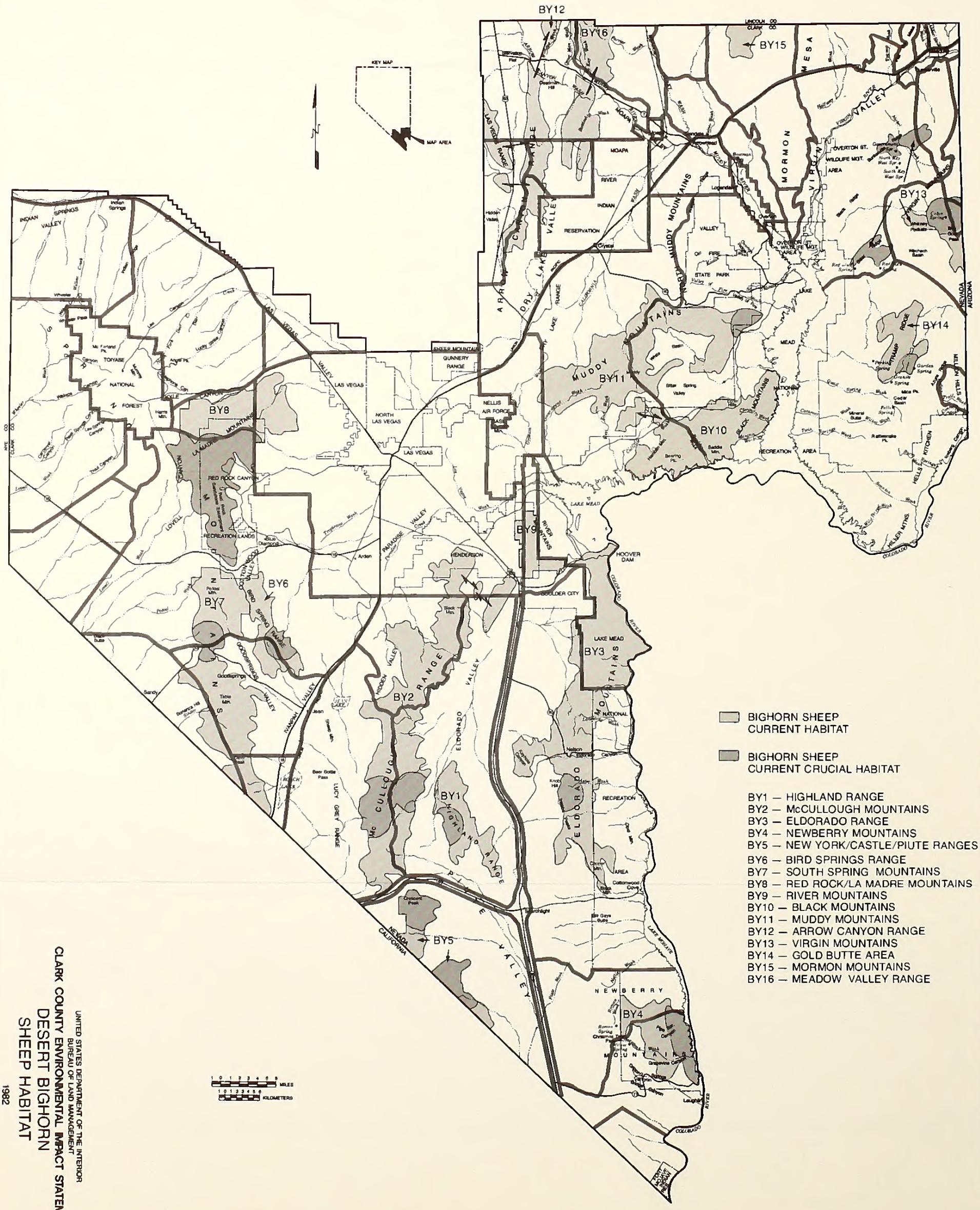
030 PERENNIAL FORBS
040 SAGEBRUSH
050 MOUNTAIN SHRUB
060 CONIFER
080 BARREN
090 PINYON/JUNIPER
110 CREOSOTE
120 MESQUITE
130 SALTBUSH
160 DESERT SHRUB
170 HALF SHRUB
180 ANNUAL FORBS
KEY MAP
MAP AREA
MILES
KILOMETERS
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT
VEGETATION
1982



BIGHORN SHEEP
CURRENT HABITAT

BIGHORN SHEEP
CURRENT CRUCIAL HABITAT

BY1 — HIGHLAND RANGE
BY2 — McCULLOUGH MOUNTAINS
BY3 — ELDORADO RANGE
BY4 — NEWBERRY MOUNTAINS
BY5 — NEW YORK/CASTLE/PIUTE RANGES
BY6 — BIRD SPRINGS RANGE
BY7 — SOUTH SPRING MOUNTAINS
BY8 — RED ROCK/LA MADRE MOUNTAINS
BY9 — RIVER MOUNTAINS
BY10 — BLACK MOUNTAINS
BY11 — MUDDY MOUNTAINS
BY12 — ARROW CANYON RANGE
BY13 — VIRGIN MOUNTAINS
BY14 — GOLD BUTTE AREA
BY15 — MORMON MOUNTAINS
BY16 — MEADOW VALLEY RANGE

UNITED STATES DEPARTMENT OF THE INTERIOR
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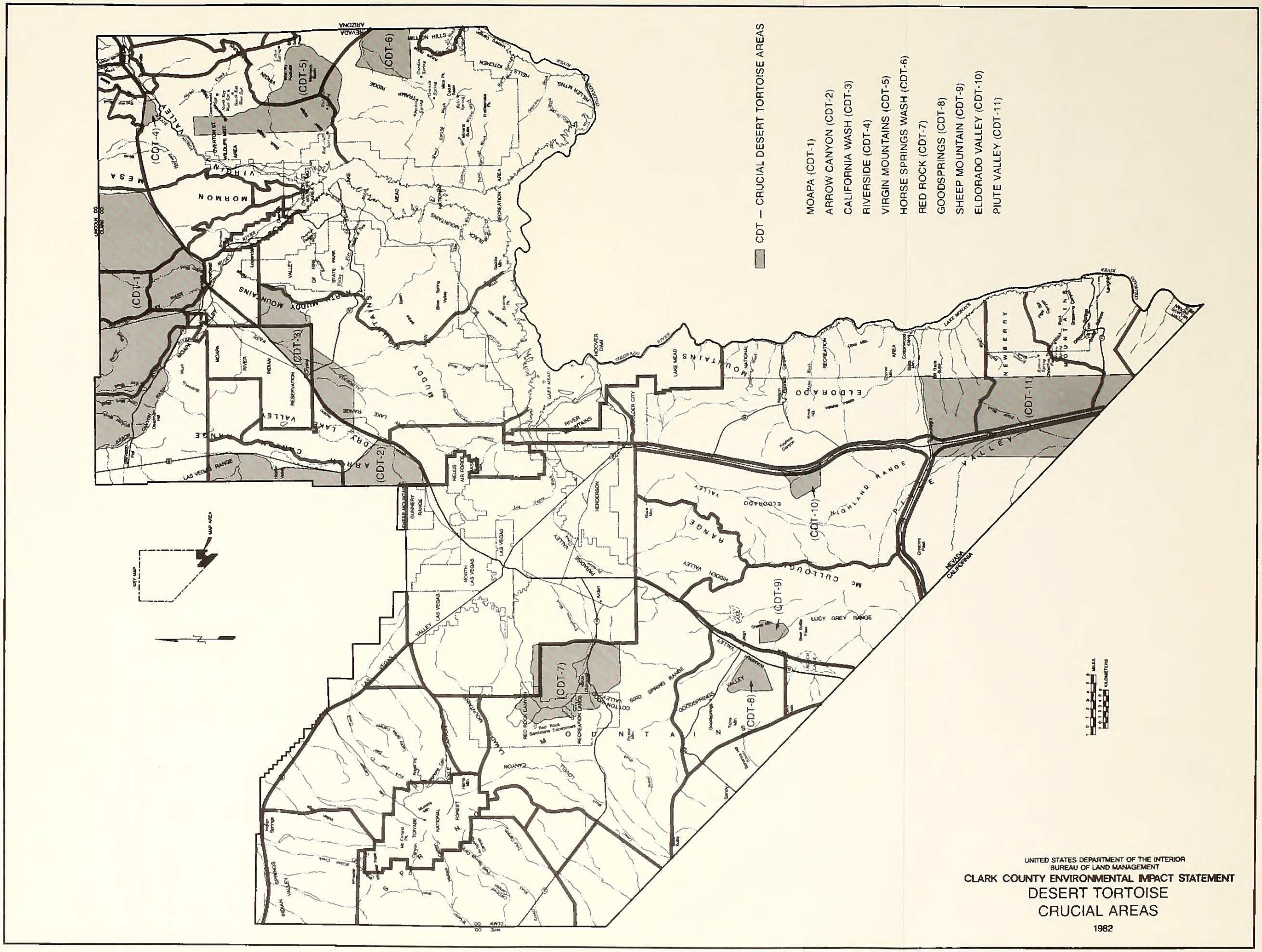
CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT

DESERT BIGHORN SHEEP HABITAT

1982


CDT – CRUCIAL DESERT TORTOISE AREAS
MOAPA (CDT-1)
ARROW CANYON (CDT-2)
CALIFORNIA WASH (CDT-3)
RIVERSIDE (CDT-4)
VIRGIN MOUNTAINS (CDT-5)
HORSE SPRINGS WASH (CDT-6)
RED ROCK (CDT-7)
GOODSPRINGS (CDT-8)
SHEEP MOUNTAIN (CDT-9)
ELDORADO VALLEY (CDT-10)
PIUTE VALLEY (CDT-11)
KEY MAP
MAP AREA
NEVADA
ARIZONA
NEVADA
CALIFORNIA
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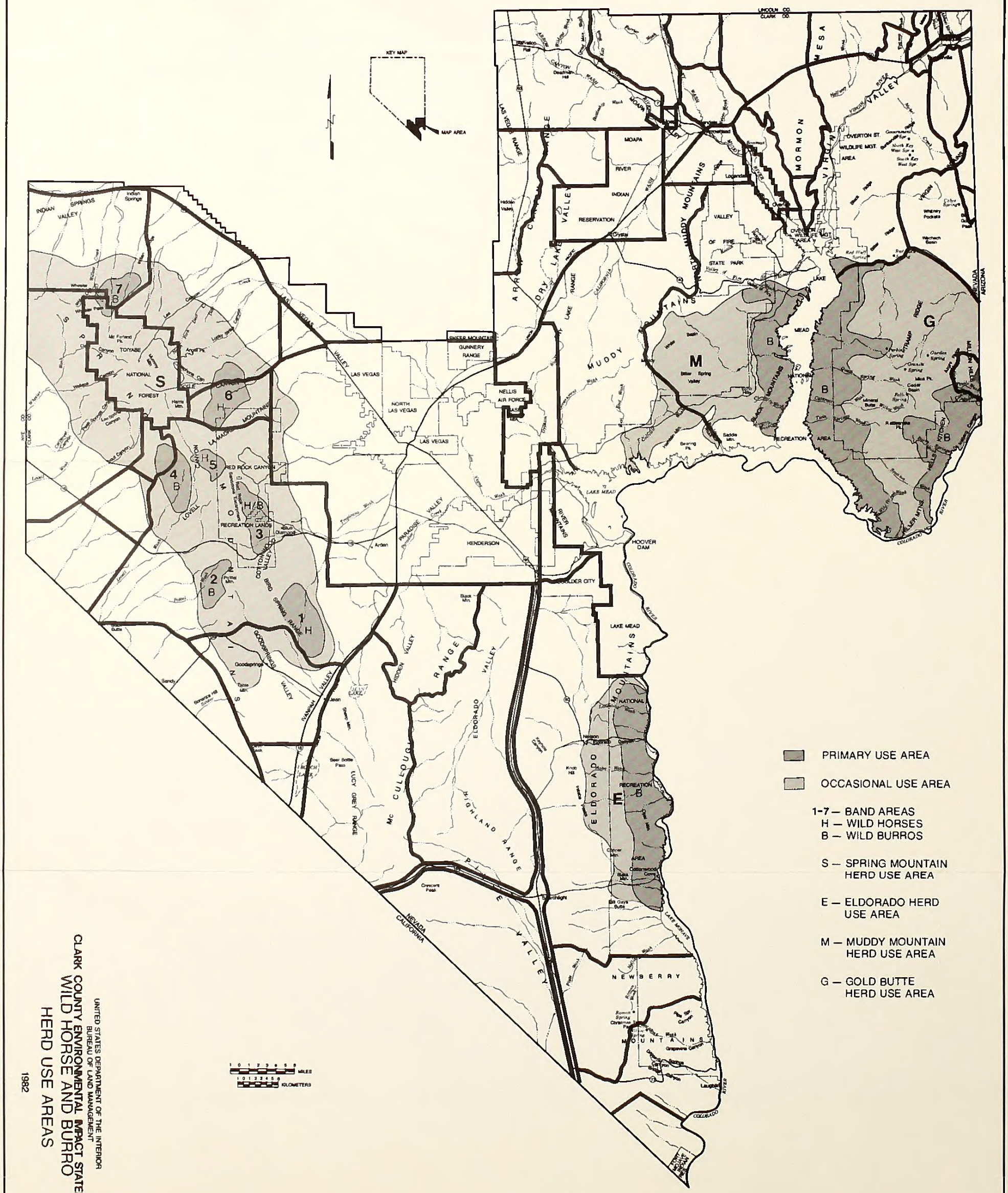
CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT
DESERT TORTOISE
CRUCIAL AREAS
1982



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

CLARK COUNTY ENVIRONMENTAL IMPACT STATEMENT
WILD HORSE AND BURRO HERD USE AREAS

1982

CHAPTER THREE

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

Chapter Three presents discussions of the environmental consequences which would result from implementation of the alternatives, including the Proposed Action. In keeping with the directives of Section 1502.2(b) of the CEQ regulations, the discussions of environmental consequences focus on impacts which are considered significant; criteria (thresholds) used to establish significance are defined under the section Determination of Significant Impacts. Exceptions to this discussion of significant impacts were made, however, when a question of potentially significant impact was raised as an issue in contacts with interested agencies or persons, in the impact analysis process, or in preliminary review of this draft EIS. In these instances the potential impact or issue is addressed even if the end conclusion is that no significant consequences would occur.

In the course of analysis, it was determined that all mitigation of the identified environmental consequences is contained either in the Standard Operating Procedures (Chapter One) or in one or more of the alternatives. The analyses in this chapter will include, where relevant, unavoidable adverse impacts, a comparison of short-term and long-term effects, and any irreversible, irretrievable commitment of resources. In many cases these components may be only generalized or may not appear at all; this is because allotment-specific and site-specific implementation within a developed timeframe will not occur until consultation through the Coordinated Resource Management and Planning Process. All adverse impacts are considered to be unavoidable adverse impacts which cannot be mitigated.

Several resources are not discussed in this EIS for various reasons. Climate and air quality are unaffected in any way by the Proposed Action or alternatives. There are no threatened or endangered plants in the grazed areas of Clark County. One candidate species in a grazed area is unpalatable to livestock. In other cases, impact analysis requires a site-specific proposal to accurately gauge effects. Thus, impacts to such values as cultural resources, visual resources, wilderness, soils and watershed, and threatened or endangered animals, cannot be evaluated until a specific project is identified. In many cases, such as wilderness, cultural resources, and visual resources, any likely impacts are also mitigated by standard operating procedures.

ASSUMPTIONS AND ANALYSIS GUIDELINES

Certain assumptions about various environmental elements have been made in the analysis of environmental consequences of implementing the alternatives.

1. Present livestock use in the county will be considered the total of the average licensed use for each allotment over the five years from 1975 through 1979 (see Table 1-1).

2. Present wild horse and burro use is the present demand, based on numbers from the 1979 inventory and projected to the present (1983), or more recent data where available.

3. Present wildlife use is the present demand. Summer use is accepted to be critical. There is or may be competition for available forage; however, the critical competitive factor is the availability of forage around water.

4. Grazing systems (allotment managment plans) would be monitored and evaluated following implementation so that periodic adjustments, if necessary, can be made on those plans not meeting multiple use objectives. Adjustments would be based on utilization studies, actual use data, trend, condition, etc.

5. Baseline data for livestock forage condition and apparent trend are the only data currently available, as are wildlife and wild horse and burro population data. Available data were used whenever applicable and extrapolated to areas for which no data were available.

6. All impacts identified in this chapter are assumed to be direct impacts unless otherwise noted in the narrative as indirect or cumulative impacts.

7. The observed range trend information may not coincide with present livestock forage condition. Observed range trend information represents observations in only one year and, therefore, may or may not reflect the actual long-term trend of an

area. It was obtained and used for analytical purposes only.

8. Change, even beneficial change, can be perceived as threatening. People, as a rule, like their established "comfort zones" and dislike those zones being tampered with. Change imposed from outside may be fiercely resisted. Change which derives from a community consultation process in which the person impacted by the change is a fully participating member whose needs and values are accommodated may face less resistence and even willing acceptance. It will be assumed, during this analysis, that all social well-being impacts, particularly adverse ones, will be strongly mitigated by the CRMP process.

9. The impacts and implications of inflation and discounting would be identical to both the costs and the benefits of a specific improvement over time. The benefit/cost (B/C) analysis is used to compare alternatives, by projecting costs and benefits and discounting cash flows over the next 25 years to a present value.

10. Although monitoring is an integral part of the Proposed Action and several alternatives, its results cannot be predicted. Adjustments in livestock usage will, therefore, not be factored into the different alternatives. Rather, several alternatives postulate a level of use significantly different from the present situation. That will constitute the analysis at different use levels.

DETERMINATION OF SIGNIFICANT IMPACTS

The purpose of this section is to identify the criteria used in the impact analysis to determine whether the anticipated impact for a particular resource is significant for that resource. An environmental impact is defined as any change in an ecosystem caused by an act of man. The point at which an impact becomes significant for a resource is called a threshold.

A threshold is the maximum amount of change that can occur in the quantity or quality of a resource before the resulting impact becomes significantly adverse or beneficial. For example, a threshold for livestock forage condition of five percent means that if five percent or more of the acres in Clark County change condition class, then this is a significant impact.

Thresholds depend on the value placed on a resource and, therefore, will vary among individuals and interest groups for any particular resource. The following thresholds have been developed for each resource by the resource specialists writing this analysis. They represent the professional opinions of writers familiar with the area, in consultation with professionals from other agencies. Sometimes a threshold is based on laws or precedents set by other agencies. These are noted.

Vegetation

Thresholds for livestock forage are:

Trend - Five percent of present BLM-administered acreage in Clark County changing trend.

Condition - Five percent of present BLM-administered acreage in Clark County changing condition class.

Livestock Grazing

The threshold of significance for changes in livestock grazing is any figure differing over 10 percent from a three- to five-year (1975-1979) average annual harvest of AUMs for either an individual operator or for Clark County public lands as a whole. Ten percent is used as a measure of significance because of its acceptance as a reduction limitation in the Department of the Interior appropriation act for fiscal years 1980, 1981, and 1982. In addition, the threshold of significance in the No Livestock Grazing Alternative is based on livestock permittee dependence (yearlong) on public rangeland of greater than 10 percent.

Wildlife

Thresholds for wildlife are:

1. A five percent change in acreage or quality of desert bighorn sheep crucial habitat, desert tortoise crucial habitat, or Gambel's quail crucial habitat.

2. A five percent change in quality of riparian or desert wash habitat, important to most other wildlife species in southern Nevada.

Wild Horses and Burros

Any change in the number of herd use areas from the present would be significant. Any change in health and condition of wild horses and burros from the present situation would be considered significant.

Economics

Three economic aggregations were used as bases of comparison in determining impact thresholds. These classifications begin at the individual household level, progress (through aggregation of households) into a sectoral level (agriculture, construction, etc.), and culminate in the combination of all sectors into an overall view of the Clark County economy. Threshold values were established largely on the basis of professional judgement, with impacts discussed in terms of effect on employment as below.

1. Any impact which causes the gain/loss of one job will be deemed significant at the individual level.

2. A change in an individual's ranch income of five percent or more will be considered significant.

Social Well-Being

The threshold for impact will be any change from the existing situation. Significance of impact cannot be quantified; rather, the impact perceived will be charted as simply beneficial or adverse.

ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

Vegetation

Ephemeral Plants

Little or no research has been accomplished on the effects of grazing on ephemeral plants. Range conservationists in southern Nevada have not observed any apparent relationship between grazing intensity and the relative abundance of ephemeral plants. One study of annual grasses indicated it was unlikely that grazing of annual plants could reduce seed production below levels needed for reproduction (Stechman and Laude 1962). Strict ephemeral licensing on the 16 allotments proposed to remain under ephemeral classification would maintain the current vegetation situation on those allotments. While no improvement to the livestock forage condition would occur on those allotments, none would be expected, given the current vegetation types there.

Ungrazed Allotments

There is some indication that failure to graze perennial livestock forage plants will result in less forage production on those plants (Stoddart et al. 1975; Holmgren and Hutchings 1972). For the 15 allotments proposed for no livestock grazing, that is probably already occurring on those allotments which have some perennial forage plants, because they have been ungrazed since at least 1975. That process would continue in the short term. In the long term, and well beyond, the vegetation would move from the livestock grazing disclimax (Tueller 1973) toward the climax or subclimax condition appropriate to the site, vegetation usage, and other factors (Stoddart et al. 1975).

Perennial Plants - Short Term

All changes to livestock forage condition will vary depending on site potential, present condition, current species composition, and climatic condition (Stoddart et al. 1975). Stoddart et al. (1975) also noted that vegetation change in the hot desert is slow because precipitation is far below the optimum for plant growth. Cox (1977) reported that damaged desert vegetation requires many years for recovery and improvement. It is likely, therefore, that because of the unfavorable climatic conditions for plant growth in Clark County and the current poor condition of much of the range, changes to perennial vegetation would not occur on a short-term basis. On the 16 Nevada-administered allotments proposed for reclassification to ephemeral-perennial and intensive or maintenance management, short-term changes would be confined to adjustment of perennial vegetation usage (numbers of livestock, periods-of-use, patterns of use) based on monitoring data.

Perennial Plants - Long Term

Livestock forage condition and trend on 15 Nevada-administered ephemeral-perennial allotments proposed for long-term intensive management would improve in the long term. Improvements are also anticipated to ground cover, species composition, plant vigor, seed production, and density (Stoddart and Smith 1955). The Nevada-administered allotment destined for the maintenance category (Upper Mormon Mesa) is considered to be at or close to its perennial potential so no significant long-term improvements are anticipated.

Development of grazing systems, either by themselves or as part of allotment management plans, would improve perennial livestock forage plants by providing timely resting from grazing pressure

(Hormay 1970). Deferred-rotation would allow for seed production, germination, and second-year plant establishment. It does provide for grazing the rested pasture during a part of the grazing year. Rest-rotation is a system in which the target pasture is rested through the entire grazing period. Use of either system would provide better opportunities for new plants to become established and for old plants to improve vigor (Stoddart et al. 1975). On the other hand, some studies indicate that the rest-rotation system is particularly effective in offsetting the impacts of drought on vegetation (Woolfolk 1960; Ratliff and Ruder 1962). Stoddart et al. (1975) also observes that the rotational order might be extended longer than a two-year cycle if growth conditions are poor or if the range is in poor condition.

Establishment of proper periods-of-use, based on the phenological characteristics of selected key perennial species in the 15 intensively managed ephemeral-perennial allotments, coupled with the grazing systems, will also enhance the condition of livestock forage (Stoddart et al. 1975).

In southern Nevada, fall and winter grazing are considered the least harmful periods of grazing use. Stoddart et al. (1975) found that arid browse ranges are best suited to winter use. Garrison (1972) found fall and winter grazing to be the least damaging to carbohydrate reserves. Allowing plants the opportunity to build up carbohydrate reserves is an important factor if plants are to maintain vigor. The loss of carbohydrate reserves in key management species is a primary factor in the loss of vigor and deterioration of range condition as reported by Trlica and Cook (1971). Resting a range or pasture from grazing use also allows seeds to ripen, seedlings to become established, and litter to accumulate between plants (Hormay 1970).

Management facilities--waters, fences, etc.--are essential if the objectives of grazing systems are to be achieved (Stoddart et al. 1975). The range improvements identified for the short term will aid in the distribution of livestock across the allotments. This will disperse grazing pressures over a larger area, thereby bringing utilization of perennial forage toward moderate or light usage in existing areas. Van Poollen and Lacey (1979) observed that reduction in utilization rates, especially when coupled with grazing systems, resulted in significant increases in herbage production.

Adjustments in livestock numbers on the 15 intensively managed ephemeral-perennial allotments, based on the monitoring studies to be accomplished, will produce significant improvements in livestock forage condition. Van Poollen and Lacey (1979) demonstrated that moderate usage (45 percent for shrubs, 55 percent for grasses and forbs--the sustained-yield use levels recommended by the Nevada Range Studies Task Group (1981)) would result in herbaceous production increases of 13 percent on western rangelands.

As a result of these actions on the 15 intensively managed ephemeral-perennial allotments, there would be a significant, post long-term (35 years) improvement in livestock forage condition on those allotments. Range in good livestock forage condition will increase by 90,000 acres, fair condition range will increase by 153,000 acres, and poor condition range will decrease by 243,000 acres (see Appendix B for methodology). Net long-term improvement in livestock forage condition will occur on 333,000 acres, or 9 percent of BLM-administered acreage in Clark County (see Table 3-1).

In the long term, setting a desirable number of wild burros to be managed in the Gold Butte herd use area based on monitoring results would achieve the goals of stabilizing that vegetation community and increasing plant diversity. This would most likely occur in the long term and after. Stoddart et al. (1975) points out that conditions similar to those in the herd use area are indicators of overuse: preponderance of less palatable plants, a community dominated by a few plant species, and a high percentage of annual plants. Other studies (Paulsen and Ares 1961) indicate that, although cover of forage plants in arid ranges in the southwestern United States is greatly reduced in dry years regardless of stocking levels, when precipitation returned to normal or better, previously heavily grazed sites produced less forage or herbage than lightly or ungrazed areas. Van Poollen and Lacey (1979) observed that herbaceous production was greater as utilization was reduced from moderate to light than from heavy to moderate.

The speed of attainment of the vegetation goals in the Gold Butte herd use area will be partly a function of the level of desirable numbers. Lower numbers (less than half of current populations) would produce correspondingly quicker vegetation response. However, should population increase rates accelerate (see Wild Horses and Burros section) after desirable numbers are reached, more frequent removals may be necessary to maintain desirable numbers and continue to attain the vegetation objective.

Desert Wash and Riparian Vegetation

Livestock tend to congregate in certain locations where conditions are most conducive to their needs. Riparian areas and desert washes are the areas in Clark County most susceptible to damage by this habit. Animals would remain in these areas

until the desirable forage is depleted. Trampling of the vegetation would also occur in these areas. Unless the animals are totally removed or better distributed, this intensive use would remove most of the ground cover, resulting in site degradation (Stoddart et al. 1975).

The 10,000 acres of major desert washes in Clark County are located in allotments proposed for intensive management. Resting or deferring grazing, as proposed for intensively managed allotments, would benefit desert wash areas. Although livestock would tend to remain in these areas, resting the sites could give key vegetation species the opportunity to restore plant vigor, and improve both range condition and forage production as discussed by Hormay (1970). This would probably occur within the short term, or two to three years after implementation of the grazing system on each allotment.

The proposed fencing of riparian areas around 18 spring sources would allow the recovery of these riparian zones from the impacts associated with livestock and wild horse or burro grazing. Recovery to good condition would probably occur within the short term (Ames 1977; Dahlem 1979).

Wildlife

Desert Bighorn Sheep

Significant conflicts affecting bighorn sheep from livestock or wild horses or burros occur in 11 of the 16 presently occupied bighorn ranges in Clark County. More detailed discussion of the existing conflicts appears in Chapter Two. It is expected that conflicts with domestic sheep in the Bunkerville (Virgin Mountains) and Christmas Tree Pass (Newberry Range) allotments will be addressed through the CRMP process. The manner of resolution and its impacts cannot be predicted at this time. Using the worst case analysis, the two bighorn populations could contract domestic sheep diseases and crash.

Conflicts are most severe where livestock and wild horse or burro range overlaps with bighorn crucial summer habitat.

In the short term under the Proposed Action, 15 known bighorn waters with conflicts from livestock or wild horses/burros occurring would be fenced to reduce competition. Water for livestock and wild horses/burros would be piped away from the bighorn crucial habitat, while maintaining water at the source for bighorn.

Over the long term, habitat management plans (HMPs) would be developed and implemented, contingent on availability of funds and manpower. Conflicts affecting existing bighorn sheep populations could be reduced as a result of HMP implementation.

Bighorn sheep populations would be expected to reach reasonable numbers in current habitat as the HMP project work described by Janke (1979) is fully implemented in the long term or shortly thereafter. This would be a significant beneficial impact.

Desert Tortoise

Under the Proposed Action, 104,300 acres of 486,200 acres of crucial desert tortoise habitat in Clark County (see Table 2-5) are within allotments that would remain ungrazed. Approximately 134,700 acres would be in allotments classified ephemeral with custodial management. Livestock grazing on these allotments would only be allowed if on-the-ground evaluations determine ephemeral forage is available, and consideration would be given to other resource needs and values (including tortoise) in the process. Thus, competition between tortoise and livestock should be minimized on 239,000 acres of crucial tortoise habitat in the short and long term.

The remaining 247,200 acres of crucial tortoise habitat would be classified ephemeral-perennial with intensive management. The past five-year-average licensed use would be the initial stocking rate at the beginning of monitoring to establish livestock base herds. If past use patterns are also followed, all 247,200 acres of the habitat would be grazed March through May, the critical season for the desert tortoise. In addition, 124,200 of those acres would be grazed yearlong. In the short term, grazing in this manner could continue to suppress tortoise populations by reducing available food needed to sustain reproduction.

Through monitoring and the CRMP process, proper base herd levels and periods-of-use are to be established. These two actions along with development of grazing systems are expected to improve the perennial vegetation over the long term. Desert tortoise could benefit because more dependable perennial forage could be available to sustain tortoises, particularly in times of low annual forage production associated with drought conditions.

Creating new livestock water sources (in both the short and long term) within tortoise crucial habitat could lead to deterioration of that habitat a half-mile or more around the new source. Until monitoring and project locations are determined, the extent of impacts to desert tortoise cannot be projected further.

Gambel's Quail

Under the Proposed Action, in the short term, 18 springs would be fenced to protect riparian areas. This would improve quail food and cover. Water would be provided in 21 new locations when the 15 troughs to protect bighorn sheep crucial habitat and the 6 troughs to improve livestock distribution are constructed. This could expand quail crucial summer habitat up to 4,500 acres. However, new livestock water developments within 1.5 miles of existing quail guzzlers would intensify grazing within previously lightly grazed or ungrazed quail crucial habitat. Further quantification of the impacts to quail is impossible until project locations are determined.

In the long term, 107,200 acres of crucial quail habitat are within allotments that would remain ungrazed by livestock. Approximately 124,350 acres of quail crucial habitat are in allotments that would remain classified ephemeral. During the summer when succulent plants are unavailable, quail become dependent upon water sources and surrounding vegetation. Livestock concentrate use around water sources also. Under ephemeral classification no livestock use would be permitted unless on-the-ground evaluations determine ephemeral forage is available. Competition between quail and livestock should be minimized, particularly in drought years (no ephemeral production) when quail populations are placed under the most stress.

The remaining 653,050 acres of crucial quail habitat are located in grazing allotments proposed for ephemeral-perennial classification with intensive management. When proper herd levels and periods-of-use are determined and implemented, intensive management is expected to improve vegetation. Quail would benefit from increased food and improved cover.

Overall, quail populations should increase with implementation of the Proposed Action. Implementation of strict ephemeral grazing on both ephemeral and ephemeral-perennial allotments would reduce the impacts drought places on quail by lessening competition from livestock. This should allow quail populations in poor years to maintain higher levels than would be presently possible under existing management.

Other Wildlife

Much of the wildlife habitat in Clark County could improve with the initiation of on-the-ground evaluations before allowing livestock grazing on ephemeral vegetation in ephemeral and ephemeral-perennial allotments, the establishment of proper livestock base herd levels and grazing periods-of-use in ephemeral-perennial allotments, and the establishment and maintenance of wild horse and burro levels within capacity of the vegetation.

A wildlife habitat inventory conducted by Las Vegas District BLM in 1979 found 18 springs with associated riparian areas being heavily trampled or denuded from intense livestock or wild horse or burro use. The Proposed Action includes fencing to protect these riparian areas, an action likely to benefit almost all wildlife species in the short and long term.

In that same inventory, 21 seasonal waters which normally dry up at the time wildlife needs are greatest were found to have potential to be developed to yearlong waters by increasing storage or other means. These springs would be developed over the 25-year long term. All water-dependent wildlife, including carnivores, bats, mourning doves, and several species of nongame birds, would benefit.

Nongame birds, rabbits, rodents, gila monsters, and other reptiles could be most affected by changes occurring in desert washes. All 10,000 acres of major desert washes are located in allotments proposed for intensive management. Grazing systems associated with intensive management would allow the plants in desert washes to rest, which does not presently occur. Thus, food and cover for many wildlife species should improve from the present situation over the long term.

Conclusion

When habitat management plans are developed and fully implemented, current bighorn conflicts should be reduced and bighorn populations should attain reasonable numbers in current habitat. Strict ephemeral grazing on 134,700 acres of desert tortoise crucial habitat should reduce conflicts. Intensive management of ephemeral-perennial allotments containing 247,200 acres of tortoise crucial habitat may also reduce conflicts, depending on the grazing system, period-of-use, and livestock base herd level established. Quail could benefit from improved food and cover on 124,350 acres of quail crucial habitat proposed for strict ephemeral use. Intensive management on ephemeral-perennial allotments may improve 653,050 acres of crucial quail habitat. Protecting springs and associated riparian areas and developing seasonal waters to provide yearlong water should benefit other wildlife. Important desert wash habitat may continue to be impacted because of the tendency of livestock and burros to concentrate in these areas, however, the degree of impact should be lessened if grazing systems that allow rest are implemented.

Wild Horses and Burros

Field inspections of ephemeral forage and consideration of other resources on all allotments prior to licensing livestock usage of ephemeral AUMs should mitigate any impacts to wild horse and burro herds caused by any competition that may be occurring with livestock.

Roundup and removal of wild horses or burros to reach or to maintain desirable numbers would impact the animals removed and may affect the herd remaining.

Impacts to burros from roundup and capture operations would be the death of from 0 to 3 percent of the animals removed, including those animals that are humanely destroyed because of disease or severe injury.

Nunn (BLM, Susanville District, personal communication, 1982) reports that losses during several burro roundups in California this year were less than one percent; out of a total of 2,697 burros captured, only 4 were lost directly due to capture and hauling. According to Grissom (BLM, Kingman Resource Area, personal communication, 1982), deaths of burros from roundup, capture, and holding in facilities in Arizona have been just under 3 percent of over 2,500 animals over a period of four years.

Dr. Charles Douglas (University of Nevada, Las Vegas, personal communication, 1982) reports no apparent death losses in roundups of 475 burros in Death Valley National Monument during 1981, but that a 3 percent mortality rate from roundup and capture would have been an acceptable level.

An acceptable level of wild horse death loss due to roundup and capture operations would be similar to those levels set for wild burros. Of the 2,129 wild horses rounded up in the Winnemucca District over the past two years, only 26 (1.2 percent) have died as a result of trapping. Between 1 and 2 percent would be considered acceptable (Jancar, BLM, Winnemucca District, personal communication, 1982). This figure is compatible with Nunn's (1982) estimate of 3 percent for losses during roundups in California (including loss in holding corrals).

There are no known studies that document the effects of removal of a given number, range of numbers, or percentage of a herd of burros. The essential unanswered question is at what population levels (raw numbers, age structure, adult-yearling-foal ratios, male-female ratios) at which burro herds become unviable (National Research Council 1980).

While that base number (if it in fact exists) is unknown, the setting of desirable numbers of burros in each herd within the carrying capacity of the range would benefit the herd. Removals (if that were necessary) to reach desirable numbers would, therefore, benefit the remaining animals.

A removal operation, conducted humanely, would not unduly stress the remaining animals. Were roundup methods used, as opposed to water trapping, for example, some foals could be separated from their dams. Some animals in the remaining herd could be injured or killed as a result of a roundup operation. Assuming no more than half a given herd was removed, from the capture experiences cited above, that death or injury loss would not exceed 3 percent of the remaining herd.

Dr. Charles Douglas (University of Nevada, Las Vegas, personal communication, 1982) related that, in the case of fully occupied habitats, reductions to levels below carrying capacity could spark a temporary surge in reproduction rates that would be a benefit to the remaining herd, but a mixed one. Should a surge in reproductive rates occur after desirable numbers are reached by removal, more frequent removals would probably be required to maintain those populations at the desired level.

Impacts from capture operations would be the same in the long term as in the short term.

Removals from wild horse and burro herds over the long term would have the same impacts as in the short term.

The possibility of significant impacts being incurred may increase in the long term. As funding becomes available after the initial five-year implementation period, range improvement projects on intensively managed allotments may be incorporated as part of an AMP or grazing system. This could affect the Eldorado, Muddy Mountain, and Gold Butte herd use areas and a portion of the Spring Mountain herd use area. Fencing that precludes animals from utilizing a traditional use area may adversely affect horses or burros by a change in the size of present herd use areas.

Livestock Grazing

Ephemeral-Perennial - Short Term

Fifteen Nevada-administered allotments would be reclassified to ephemeral-perennial, placed under intensive management, and a monitoring program initiated. Since the initial stocking level is the average licensed use from 1975-1979, which is an undistinguishable mix of annual and perennial usage, there could be a short-term downward adjustment in the perennial usage on some allotments as utili-

zation data becomes available. That adjustment, however, would be compensated for, to a degree, by continued ephemeral licensed use.

Ephemeral-Perennial - Long Term

As the elements of intensive management are developed on the 15 allotments (AMPs, periods-of-use, range improvements) livestock forage condition will improve on 333,000 acres (see Vegetation section). That means increased production of perennial forage on those allotments which, combined with the ephemeral use, would result in a net long-term increase in AUMs over and above the current average annual harvest of 24,158 AUMs on the ephemeral-perennial allotments. The amount of increase, however, is unpredictable.

Ephemeral - Short and Long Term

Strict pre-license inspections for ephemeral forage would ultimately have a significant adverse impact on livestock operations on allotments retaining their ephemeral classification. That is particularly true of operators who now graze yearlong and have no private pasturage or other public land allotments which might be used during that first dry year when no or insufficient annual forage is produced.

Of the 16 allotments proposed to remain ephemeral, five are currently grazed yearlong. All five operators have no private land suitable for pasturage; one has another allotment proposed for reclassification to ephemeral-perennial.

At the first instance of denial of ephemeral use, the four yearlong ephemeral operators without private land or other usable allotments would be required to radically change their operations. They would have the options of renting private pasturage or selling off their current herds. That circumstance would affect a total of 649 AUMs (five-year-average use) or 2 percent of the total AUMs harvested. The yearlong ephemeral operator with another allotment, if he were unable to use it, would face the same choice for 3,711 AUMs or 12 percent of the total harvested AUMs.

In all, 4,360 AUMs or 14 percent of total AUMs harvested would be affected, particularly if the livestock had to be sold. That would be an adverse impact to the cow/calf operation, considering the complex process of building, maintaining, and breeding a base herd. Whether the impact would in fact be adverse (and at the level cited, significant), would depend on the ability and willingness of the operators to move into a livestock feeder operation; for, although denied an ephemeral grazing license in one period, they would still be able to apply for use of the annual forage produced on the allotments in subsequent periods or years. However, were the operators to choose to leave the livestock business, this then would be a significant adverse impact to livestock grazing on both the individual and county level.

On the other 11 allotments proposed for retention under ephemeral classification, grazing occurs for six months or less each year. Operators using these allotments have either private lands or other public land allotments which could be worked into systems (through CRMP) to offset the effects of strict ephemeral inspections.

Ungrazed Allotments

Elimination of grazing on the seven allotments which are allotted but have not been grazed for at least the past seven years would not impact the livestock operations of persons who previously grazed livestock on these allotments. Any impact would have occurred at the time the operators stopped, of their own volition, using those allotments to support their operations.

Conclusion

On all 16 ephemeral-perennial allotments, there could be short-term adverse impacts as monitoring probably would indicate a need to reduce perennial forage utilization. However, in the long term, the base herds would increase. In both the short and long term, use of annual forage would offset apparent adverse impacts.

Where yearlong grazing now occurs on 16 ephemeral allotments, significant adverse impacts would occur to five livestock grazing operations, and to the overall harvest of livestock AUMs on public lands in Clark County. These impacts appear to be unmitigatable.

No impacts would occur to seven livestock operations owned by persons who formerly grazed allotments where no grazing would be allowed.

Economics

Rancher Economics

The Proposed Action could impact the economics of the livestock operators differently depending upon whether the allotment is reclassified ephemeral-perennial or remains classified ephemeral.

A major adverse impact to the rancher from the Proposed Action would result from the strict ephemeral inspections proposed. The denial of range use to permittees whose allotments are classified ephemeral and who have no access to private or other public range, would require radical changes in the operations of up to five permittees, to include leaving the livestock business.

Operators could be required to remove their livestock from the allotments during dry years. One solution in the short term would be for the operator to purchase either feed or pasture for up to six months. Livestock operators would have to compete for available forage with the dairy industry, which often utilizes any available pastures for dry cows. This conflict is further complicated by the large and increasing number of recreational horse owners in metropolitan Las Vegas. These two interests are very competitive for all available forms of pasture and baled hay. A current permittee, with a seemingly marginal business, may not be able to afford the high cost of feed. Operators with cropland could choose to continue present cultivation and marketing practices, rather than move production to grazing the land.

Another alternative would be to sell the cow/calf operation, including the livestock. Operators could stay in the livestock business by purchasing feeder calves and grazing them upon the allotments during those years when ephemeral forage is available. This practice has been used by operators in the BLM's Phoenix (Arizona) District for many years. Some operators have achieved good financial returns. This usage requires at least 90 days of good ephemeral forage, a favorable market with a stable or increasing price, and the ability to raise sufficient capital at a reasonable cost. If all three conditions do not exist, most operators in Arizona do not use the allotment that year. Some operators in Arizona have misjudged the external conditions and, although the forage was good, they suffered financial losses from declining markets or rising interest rates (Haines, BLM, Kingman Resource Area, personal communication, 1981).

It is difficult to anticipate how many operators would choose this alternative if they could no longer operate as a cow/calf producer, since the option has been available to them in the past. Most have chosen not to change and enter the feeder calf industry.

The economic impact on the five operators would vary according to the dependence the family has upon that income from the ranching operation. In most cases, the permittees in Clark County have income other than their ranching income. Were the ranch income eliminated, a major adverse impact could occur. However, without access to the individual's personal income records, it is impossible to determine the significance of the income loss.

Operators on the other allotments remaining classified ephemeral would be impacted by strict ephemeral inspections in varying degrees. The ability to buffer the lack of annual forage in dry years by using private land or other usable allotments would mitigate some of those effects, but to an undeterminable degree. The economic impact is equally impossible to determine.

On those 16 Nevada-administered allotments proposed for ephemeral-perennial reclassification, economic impacts would be determined in the long term by adjustments of livestock numbers based on the results of monitoring. The impacts cannot be determined or analyzed at this time.

No impacts to rancher income are expected, except to those five operators who have been grazing yearlong and are subject to field inspections of ephemeral forage. These operators will suffer a loss of income from 4,360 AUMs of $12,557. These impacts are significant to the affected individuals but not to the county or industry income levels.

Rancher Net Worth

Five yearlong operators on ephemeral allotments would be subjected to losses of $109,000 (4,360 AUMs). This analysis assumes that the operators impacted suffer the reduction of all AUM-associated assets and do not re-enter the industry as feeder/stocker operators. It also assumes the operator has complete vested interest in the sheep AUMs lost in Clark County. If, in fact, the operator has only a partial interest or a lease, in the AUMs, this analysis will have overstated net worth lost. These changes to net worth are significant to the individual, but insignificant to the sector and county levels of net worth.

Wildlife Economics

The bighorn sheep population is expected to reach reasonable numbers in current habitat during the long term, but at a slower rate than under the No Livestock Grazing alternative. This would result in increased hunting values.

With the development and implementation of HMPs, bighorn sheep would reach reasonable numbers in current habitat, providing an additional 92 hunting tags with an associated annual value of $128,570. An additional 11 people would become employed as hunting guides for bighorn sheep on BLM-administered lands. These benefits would occur over the long term of 20 years.

Small game would be expected to benefit from the installation of drinkers, escape devices, spring development, and additional spring maintenance. The projected improvement, based on acreage, ranges between that expected during a wet year ($591,500, see Appendix C) and approximately 14 percent of that level ($82,810). The minimum of 14 percent increase is based upon improvement to 124,350 acres of crucial quail habitat (approximately 14 percent of all crucial quail habitat in the county) that is located within allotments remaining ephemeral and subject to strict ephemeral inspections. These benefits are projected to occur equally in years 6 through 10 of the analysis (see Appendix Table D-3).

Economic benefits are derived by maintaining the populations of small game animals at higher levels. Populations would still fluctuate with changes in precipitation from year to year. However, management under the Proposed Action would maintain the numbers at higher levels during dry years, thus additional animals and hunting will result in additional income to the businesses and people in Clark County.

Benefit/Cost Analysis

The Proposed Action would create additional economic returns overall.

A decrease of 4,360 AUMs on ephemeral allotments would decrease rancher income county-wide by $12,577 (calculated at a value of $2.88/AUM, based on large rancher net profit). The present value of these income and cost flows over 25 years at a current discount rate of 7.625 percent is presented in Appendix Table D-3.

The increase in hunter-days would represent a minimum of $82,810 from small game. This increase would occur equally during the years 6 through 10. The benefit from increased bighorn sheep hunting would be $128,570. This increase would occur equally over the long term of 20 years.

The present value of the costs from Appendix Table D-3 is $631,183; the present value of the benefits is $707,944. The benefit-to-cost ratio is 1.12 to 1 ($707,944 to $631,183).

There are no positive benefits projected during the short term. This may not reflect actual conditions, but it is a worst case analysis, where small game and bighorn sheep numbers do not increase until after the short term. Depending on precipitation, some benefits to small game could be projected in the short term, and this in turn would increase the benefit/cost analysis. If the benefits to small game were spread over the short term, the benefits would be increased by $311,945.

Social Well-Being

The Proposed Action portends change to several groups in southern Nevada. Direct lifestyle impacts would occur to those individuals whose economic situation is changed, for better or worse. This would most strongly be true of livestock operators and bighorn sheep guides, especially if the change were to be for the worse. Lifestyle aspects of ranching, rather than economic, are a (if not the) principal reason for many Clark County operators to be involved in it.

Indirect social well-being impacts could occur to those affected interests whose stake in the resolution of resource conflicts does not involve direct economic or lifestyle factors (see Appendix E).

Table 3-2 charts the anticipated perceptions by selected interest groups of the impacts of the Proposed Action on their interests. The chart is based on nearly a half dozen years of observations of these groups' reactions to comparable actions by the BLM. The rationale used is that a negative reaction by the group or its leaders indicates that the group and its members perceive their interests or social well-being are adversely affected by that action. The converse holds for positive group reactions.

Reading across the chart, a notation under a resource indicates the interest group on that line would probably perceive its interests affected by a change in that resource value or use. An "A" indicates an adverse impact, and a "B" indicates a beneficial impact. No notation indicates either that the affected interest may not perceive an impact or that BLM cannot predict an impact. It can be inferred that the more As or Bs displayed, the more that interest group would perceive its social well-being impacted.

Some representative groups found within the "affected interest" categories are as follows:

Wild Horse and Burro Groups: American Horse Protection Association, Humane Society of Southern Nevada, Animal Protection Institute, WHOA, Fund for Animals, National Mustang Association, the National Wild Horse Association, and the International Society for the Protection of Mustangs and Burros.

Livestock Groups: Nevada Cattlemen's Association, Nevada Woolgrowers Association, N-5 Grazing Advisory Board, Las Vegas District Grazing Advisory Board, and the National Cattlemen's Association.

Bighorn Sheep Groups: Fraternity of the Desert Bighorn, Desert Bighorn Council, Nevada Wildlife Federation, sportsmen's clubs, bighorn sheep hunt-

ers, and the Nevada Chapter of The Wildlife Society.

Desert Tortoise Groups: Desert Tortoise Council, and the TORT Group.

Conservation Groups: Sierra Club, Natural Resource Defense Council-Public Lands Institute, Audubon Society, National Wildlife Federation, The Wilderness Society, National Outdoor Recreation Association-Public Lands Task Force, and the Northern Nevada Native Plant Society.

ENVIRONMENTAL CONSEQUENCES OF THE NO ACTION ALTERNATIVE

Vegetation

Ephemeral Plants

Impacts to ephemeral plants would be the same as those under the Proposed Action with respect to all 39 Nevada-administered allotments which would be eligible for grazing under this alternative.

Perennial Plants

Under this alternative, grazing on the 16 Nevada-administered allotments with actual or potential production of perennial forage would continue under the guise of ephemeral grazing. Without a requirement for inspection prior to ephemeral licensing, when ephemeral plants are not, in fact, present on some allotments, the perennials would bear the full grazing pressure. On others, when inspections are made and ephemeral use licensed, grazing may take place on perennials at inappropriate times.

Stoddart et al. (1975) discusses the adverse effects on perennial forage plants resulting from overutilization or use during critical growing seasons. Shrubs in particular, it is noted, respond to heavy and repeated clipping during the growing season with rapid declines in subsequent forage yields and accelerated plant mortality. Similar results are cited for arid range grasses with increased frequency of clipping and closer harvesting in any one year. A more significant effect is the cumulative impact of such grazing pressure over a span of years. Stoddart et al. (1975) also stated that the Southwest Desert ranges probably had originally a greater abundance of perennial grasses than are apparent now.

While current grazing management practices may be responding to the apparent availability of forage in general in the short term, perennial forage is not being managed as such. Long-term results would be continued loss of perennial grasses and shrubs which are now available for livestock forage.

In the Gold Butte herd use area, maintenance of current numbers of burros would probably slow or halt the vegetation community change now occurring. It probably would not accommodate the rediversification of the community.

Desert Wash and Riparian Vegetation

Under the No Action Alternative, a severe adverse impact to unprotected riparian vegetation and desert washes would be expected (Ames 1977). The increased damage caused by concentrated use, especially around the 18 natural water sources identified as currently impacted, would cause further overall deterioration of those areas and eliminate the understory herbaceous layer and stand reproduction (Davis 1977). Areas denuded of vegetation would continue to grow with overuse.

Important desert washes were identified in inventories by the presence of indicator vegetation species (see Chapter Two). There are nine major areas of concern in the county that are affected by grazing. The total acreage of these major areas is 10,000 acres; currently, all 10,000 acres are in poor condition. There are numerous smaller desert washes and springs which are unquantifiable and will be affected by grazing the same as the major washes. If concentrated use continues, this small percentage of desirable and intermediate species would decline in these washes until these species were eventually eliminated.

Wildlife

Desert Bighorn Sheep

Nothing would be done to resolve existing conflicts with livestock or wild horses and burros (see Chapter Two discussion) in bighorn ranges under the No Action Alternative. No monitoring or other measures to determine proper utilization levels would be undertaken. It is unlikely that bighorn populations would expand and very possible that declines may result if overutilization, should it be occurring, is allowed to continue.

Desert Tortoise

Approximately 381,900 acres of the 486,200 acres of crucial desert tortoise habitat in Clark County are grazed by livestock. All of the 381,900 acres grazed by livestock are used during the critical time period (March through May) for desert tortoise, with 170,400 acres being grazed yearlong.

Under the No Action Alternative, neither on-the-ground evaluations before permitting livestock use of ephemeral forage nor consideration of desert tortoise needs would be accomplished. Continued competition for spring annual forage may contribute to the decline of tortoise populations, where crucial habitat is grazed, to nonviable levels.

Gambel's Quail

Approximately 777,400 acres of the total 884,600 acres of crucial quail habitat in Clark County is grazed by livestock, 600,900 acres yearlong.

Quail populations in southern Nevada reflect yearly precipitation levels, expanding in good rainfall years and decreasing in poor. Under the No Action Alternative, nothing is proposed to alleviate competition during dry years. In poor rainfall years, quail populations dependent on areas around heavily utilized livestock or wild horse and burro waters would drop further than if grazing competition did not exist.

Other Wildlife

Riparian and desert wash habitat types, important to many wildlife species, would continue to be impacted under the No Action Alternative (see Vegetation section). Wildlife habitat inventories conducted by Las Vegas District BLM in 1979 for Clark County indicate at least 18 springs and associated riparian areas are being heavily impacted by livestock and/or wild horse or burro trampling and foraging. Some desert washes are also considered significant habitat because the presence of mesquite, desert willow, tamarisk, or catclaw acacia provides habitat diversity and structure. Livestock or wild horses and burros would continue to concentrate use in important desert wash habitat.

The highest concentration of nongame birds is found in these areas. Nesting cover and food plants can be expected to remain deteriorated.

Washes of the Colorado River system are considered gila monster (State-listed *rare*) habitat. Deteriorating range could affect its prey species.

Wild Horses and Burros

Under the No Action Alternative, continuing to license livestock use of ephemeral forage without conducting prior field inspection or considering wild horse or burro needs would perpetuate any existing competition for forage among livestock and wild horses and burros.

Maintenance of current numbers in the Spring Mountain, Muddy Mountain, and Eldorado herd use areas may, in fact, continue wild burro use within carrying capacities. Given the vegetation community successional change ongoing in the Gold Butte herd use area, maintenance of current numbers there could cause the herd to continue to exceed carrying capacity with long-term adverse impacts to the herd.

Impacts occurring to excess animals in the process of removing them to maintain current herd numbers would be the same as those discussed for the Proposed Action. Impacts of removal to the remaining herd would be the same as under the Proposed Action.

Livestock Grazing

In the short term, current livestock operations would be unaffected. However, more ephemeral grazing could be made available on the seven allotted but currently ungrazed allotments. In the long term, as the amount of perennial forage produced declines, operators, particularly those currently with yearlong use patterns, would begin to experience lower percentage calf crops, less weight gain on animals, and higher mortality. However, it is probable the perennial range will have hit rock bottom before its effects are noticeable on the livestock (Stoddart et al. 1975).

Other Uses

On the seven currently ungrazed allotments, the use conflicts identified in Table 1-3 would be initiated with the licensing of livestock grazing.

Economics

Rancher Economics

This alternative would make no change in present livestock management. If the range is overuti-

lized, short-term impacts would be minimal. Long-term impacts resulting from decreasing forage would be a decline in the percentage of calf crop and the calf weaning weights, and an increase in the livestock mortality rates. Rancher sales and net income would decline from these cumulative impacts, although the extent of the adverse impact is unquantifiable, and the significance of the impact is unknown.

If the range is being underutilized, livestock have already achieved maximum expected levels of production. No additional economic benefits would therefore be expected from underutilization.

No change in rancher income or net worth is projected under this alternative.

Wildlife Economics

Wildlife and associated recreational values would be adversely impacted under this alternative, but impact levels cannot be predicted. Bighorn sheep hunting could decline, but the extent and time schedule cannot be accurately projected.

Benefit/Cost Analysis

The cost projected for the No Action Alternative is $185,852. The benefits projected are all negative or zero. Therefore, the benefit-to-cost ratio is at best 0 to 1, and the alternative could result in a net loss to county income of over $7,250,000 (see Appendix Table D-4).

Social Well-Being

See Table 3-3 and the discussion under Social Well-Being for the Proposed Action.

ENVIRONMENTAL CONSEQUENCES OF THE NO LIVESTOCK GRAZING ALTERNATIVE

Vegetation

Ephemeral Plants

Impacts to ephemeral plants would be the same as those described for the Proposed Action.

Perennial Plants

A significant beneficial impact to perennial forage vegetation from the release from livestock grazing pressure would be an improvement to range condition and trend (Van Poollen and Lacey 1979). This may begin to occur late in the short term. Both Stoddart et al. (1975) and Cox (1977) indicate that improvements to desert vegetation as a result of changes in use would be realized in the long term.

Range in good livestock forage condition would increase by 24,000 acres; fair condition range would increase by 307,000 acres; and poor condition range would decrease by 331,000 acres. The net improvement in livestock forage condition would be 355,000 acres, or 10 percent of BLM-administered acreage in Clark County (see Table 3-4; see Appendix B for methodology). Approximately 550,000 acres currently in apparent static or downward trend would be expected to improve to an upward trend. This would be a significant beneficial impact. However, because of the low percentage of desirable and intermediate species in the vegetation composition, improvement of desirable and intermediate species by 15 to 20 percent would still place a majority of the livestock forage in Clark County in poor condition.

Under this alternative, management would encourage improvement in ecological condition of the range, as discussed in the Ungrazed Allotments section of the Proposed Action. With no livestock grazing, the vegetation communities would move toward natural climax rather than being managed at that disclimax stage (Tueller 1973) which is most conducive to good livestock forage conditions. However, data are not available to evaluate current and projected ecological condition of the range.

Significant movement in this direction would no doubt well exceed the identified long term. Damaged desert vegetation requires many years for recovery and improvement, as reported by Cox (1977). With the unfavorable climatic condition for plant growth in this area, changes and improvement of the vegetation would require many years.

The vegetation reaction to the removal of 98 burros from the Gold Butte herd use area would be comparable to that of the Proposed Action, but to a significantly lesser degree in the extent of the response and a significantly longer time in which the response occurs.

Desert Wash and Riparian Vegetation

A significant beneficial improvement to the 18 riparian zones and to the vegetation found in the 10,000 acres in the nine major desert washes

would be expected from this alternative, probably within two years after elimination of grazing. Springs and riparian areas would have an increased density of virtually all herbaceous species, while improvement to all species in desert washes would be expected. With the availability of water at these sites all riparian and desert wash areas would recover (Ames 1977; Dahlem 1979).

Similar beneficial impacts to those riparian zones on the Spring Mountain allotment that are currently being impacted by wild burros would accrue with the protective fencing of those areas.

Wildlife

The No Livestock Grazing Alternative would eliminate any present or potential conflicts between wildlife and livestock. Habitat management plans would be developed for bighorn sheep and in desert tortoise crucial areas. Habitat quality is expected to improve, especially around water sources and desert washes where livestock would normally concentrate use.

Desert Bighorn Sheep

The Clark County URA identifies approximately 578,700 acres of presently unoccupied historic bighorn habitat as available on public lands. Elimination of livestock grazing with accompanying habitat improvement would allow bighorn to occupy the historic habitat. This potential habitat could support approximately 4,500 additional bighorn (Clark County URA 1981). Habitat improvement along with elimination of livestock grazing would allow bighorn to attain reasonable numbers (5,010 animals) in currently occupied habitat. A total of 9,510 animals could be supported under this alternative. This would be a significant beneficial impact.

Desert Tortoise

Approximately 381,900 acres of the 486,200 acres of crucial desert tortoise habitat that is presently grazed by livestock would no longer be grazed under this alternative. Competition from livestock for early spring annual growth in drought years when such annual growth is limited would not occur. Slow habitat recovery over the long term (see Vegetation section) would be expected. With precipitation as a limiting factor, perennial grasses which would provide tortoise with more dependable forage in years of drought would eventually increase.

Female tortoise mortality would be reduced because they could recover from the heavy demand of egg laying faster than if intense livestock competition for available forage in the early spring were occurring. Higher female survival and faster recovery from egg laying would promote higher reproduction in tortoise populations, a significant beneficial impact.

Gambel's Quail

Approximately 724,300 acres of crucial quail habitat in Clark County would no longer be grazed by livestock. Over the long term, quail food and cover should improve, particularly around livestock waters and in desert washes. Present wet-year quail population levels may become the normal average at the end of the long term in response to vegetation changes resulting from elimination of livestock grazing (Lee, NDW, personal communication, 1981).

No benefits to quail would occur on 53,100 acres of crucial habitat where livestock would be removed and wild burros substituted.

Other Wildlife

Approximately 2,583,650 acres of wildlife habitat would no longer be grazed by livestock. All livestock-wildlife conflict would end.

Riparian habitat associated with those springs presently trampled by livestock would improve over the short term (five years) without protective fences having to be constructed. Those springs with only burro trampling would be fenced and water piped outside for burro use, also resulting in short-term improvement to associated riparian areas.

Desert wash habitat (10,000 acres) and habitat around any livestock water sources would improve over the long term.

Nongame birds (including raptors), reptiles, amphibians, some species of rodents, doves, rabbits, and carnivores would benefit from the desert wash improvement.

Conclusion

Elimination of livestock grazing together with some habitat improvement associated with HMPs would allow bighorn to achieve reasonable numbers (5,010 animals) in current habitat and to expand into historic range (an increase of 4,500 animals). Competition with livestock would be removed, allowing higher reproduction in desert tortoise populations, thereby encouraging viability.

Quail food and cover should improve, encouraging population increases. Riparian and desert wash habitat important to many wildlife species should also improve.

Wild Horses and Burros

Under the No Livestock Grazing Alternative, the impacts of removing 98 burros (20 percent of the herd) from the Gold Butte herd use area would not be significant to the burro herd. If the removal from Gold Butte leaves the remaining herd at below carrying capacity in the herd use area, the impacts may be beneficial in terms of higher reproduction rates, as seen in similar situations by Douglas (University of Nevada, Las Vegas, personal communication, 1982).

Impacts to the 98 removed burros would be the same as those discussed for removals under the Proposed Action.

The impacts of introducing 83 of the Gold Butte burros to the Muddy Mountain herd use area and increasing that burro herd by 68 percent (to 205 animals), are not expected to be significant to the herd. Impacts due to introductions and interbreeding of different populations are expected to be positive rather than negative (Douglas, University of Nevada, Las Vegas, personal communication, 1982).

The impacts of introducing 15 of the Gold Butte burros to the Eldorado herd use area and increasing that burro herd by 11 percent (to 154 animals) are also not expected to be adverse or significant.

No impact to wild horses and burros in the Spring Mountain herd use area is expected as a result of allowing the bands there to increase by 20 percent.

Impacts to animals removed periodically over the long term in order to maintain herd numbers achieved in the short term would be the same as those discussed under the Proposed Action.

Livestock Grazing

The impact to livestock grazing from this alternative would be adverse and significant. Use of 30,856 AUMs would be eliminated. Operators would have to purchase forage or rent pasturage on private lands in the county. As this is economically unsound and many operators have no private land, their livestock operations would be eliminated. The 12 active operators with grazing privileges on allotments outside Clark County could have the grazing systems on those allotments jeopardized by the loss of ephemeral grazing privileges in Clark County. In all, this alternative would significantly and adversely impact the public land livestock operations in Clark County.

Economics

Rancher Economics

Under this proposal, current Clark County grazing permittees with a high degree of dependency upon BLM lands would be eliminated. It will force operators to seek other suppliers of forage. The cost of this alternative forage is much larger than the current costs of grazing on BLM land and the availability is very limited because of the small amount of private land in agriculture in Clark County. Livestock operators will have to compete for available forage with the dairy industry, which often utilizes any available pastures for dry cows. This conflict is further complicated by the large and increasing number of recreational horse owners in metropolitan Las Vegas. These two interests are very competitive for all available forms of pasture and baled hay. It is unlikely that current permittees with seemingly marginal business could afford the high cost of feed. Even those operators with cropland would probably choose to continue present cultivation and marketing practices, than move production to grazing the land.

This impact would be significant on the individual level. It would impact all permittees. The degree of the impact would vary with the current dependency the permittee has on grazing income versus other income. Most of the permittees have employment or other income in addition to the grazing income.

Rancher Net Worth

Most permittees feel they have an asset value in their BLM allotment. This has been either purchased or inherited, and is recognized by many financial institutions as having value. Rancher net worth, county-wide, would decline by $771,400. This loss would be an adverse impact upon each permittee, but the size or significance of the total impact to rancher wealth and well-being is unavailable. Since Clark County assessors don't value or tax grazing permittees (Slark, Clark County Assessor's Office, personal communication, 1981), there would be no impacts to the county's tax income.

There would be four full-time employees displaced by this alternative. This would be significant on the individual level, but there would be no sig-

nificant impact to county employment or income or to the livestock industry in Nevada.

Wildlife Economics

The bighorn sheep population will increase to reasonable numbers in both current and historic habitat, assuming that the habitat management plans (HMPs) identified by Janke (1979) are implemented. The bighorn population is expected to increase by 8,211 animals with an annual projected economic increase, based on hunter-day values, of $284,600. This increase will occur over a period of 25 years.

Based on the current hunter-to-guide ratio, 24 more people will become employed as bighorn sheep hunting guides.

The amount of small game hunting will continue to fluctuate as a result of annual precipitation, but the removal of livestock grazing will increase the value of small game hunting to the minimum level achieved in a wet year (Lee, NDW, personal communication, 1981). This increase represents $591,500 (see Appendix C). If the bighorn sheep HMPs are implemented, additional small game habitat would be expected, but numbers and value cannot be quantified.

Benefit/Cost Analysis

The HMPs would cost $910,000. The projected annual return would be $284,600. This figure will accrue equally over 25 years. Small game hunting would return $591,500 annually, which will also accrue equally over 25 years. Annual losses of livestock industry income would total $88,865. The present value of the benefits of this alternative would be $413,070. The total present value of the projected benefit over the 25-year period would be $2,644,325 (see Appendix Table D-5). The benefit-to-cost ratio of this alternative would be 6.4 to 1.

Social Well-Being

See Table 3-5 and the discussion under Social Well-Being for the Proposed Action.

ENVIRONMENTAL CONSEQUENCES OF THE LIVESTOCK PRODUCTION ALTERNATIVE

Vegetation

Ephemeral Plants

Impacts to ephemeral plants would be the same as those discussed for the Proposed Action on the 47 Nevada-administered allotments where ephemeral grazing is licensed.

Perennial Plants - Short Term

For the reasons discussed in the Livestock Grazing section under the Proposed Action, monitoring in the short term would probably demonstrate overutilization of perennial forage in the 16 ephemeral-perennial allotments if use was licensed at 28,989 AUMs. However, utilization would be much heavier than that experienced under the Proposed Action. Although the utilization would be adjusted to appropriate levels in the short term, the initial burst of heavy utilization may result in the requirement of a longer time than in the Proposed Action for the perennial forage capacity to reach a sustained-yield level. Van Poollen and Lacey (1979), for example, observed a greater production of herbaceous material on western ranges when grazing pressure within a grazing system was reduced from moderate to light than when the reduction was from heavy to moderate. In an analagous study, Paulsen and Ares (1961) reported that, after a drought period, production from lightly grazed areas in the Southwest was greater when precipitation returned to normal than from heavily grazed or protected ranges once again receiving normal or better rainfall.

Perennial Plants - Long Term

Impacts would be the same as for the long term in the Proposed Action once monitoring has established a sustained-yield grazing level and AMPs and range improvements are installed. However, because of the initial heavy use, achievement of vegetation improvements under this alternative could take somewhat longer than the Proposed Action, that is, beyond the 35 years identified in that course.

Reduction of the Gold Butte, Muddy Mountain, and Eldorado wild burro herds would have little

effect on vegetation condition if the niche was immediately refilled by livestock. Currently, the Gold Butte herd does not use space occupied by livestock as well. If that situation were to continue, reducing the herd by half would advance the vegetation objective there. However, as pointed out in the Wild Horses and Burros section in the Proposed Action, reductions could spark strong reproductive activity. Unless periodic removals were accomplished, little or no vegetation improvement would be seen in the long term.

Desert Wash and Riparian Vegetation

Because of the establishment of the AMPs and grazing systems, the 10,000 acres of major desert washes would be benefited under this alternative in the same way they would be under the Proposed Action. The benefits could take longer to accrue, however, than under the Proposed Action because of the initial heavy livestock grazing projected under this alternative.

Riparian habitats would continue to be impacted as described under the No Action Alternative since no protective measure to exclude livestock use would be accomplished under this alternative.

Wildlife

Desert Bighorn Sheep

Under the Livestock Production Alternative, allowing a 20 percent increase above the past five-year-average licensed use for livestock on ephemeral-perennial allotments would compound the bighorn conflicts with livestock presently occurring in the Highland, McCullough, New York/Castle/Piute, Virgin, and Gold Butte bighorn ranges. This impact would be greatest in the short term.

Livestock would be allowed to graze on approximately 145,475 acres of yearlong bighorn habitat within presently ungrazed allotments. Competition for space, forage, and water where no competition had previously existed could force the bighorn to abandon the portions of their ranges that are accessible to livestock (Wilson 1968). The competition would be highest and most detrimental in the 44,200 acres of crucial summer habitat in the Newberry, South Spring, Red Rock/LaMadre, and River Mountain bighorn ranges.

Domestic sheep grazing would be allowed in the Christmas Tree Pass allotment (Newberry Mountain bighorn range) and the Bunkerville allotment (Virgin Mountain bighorn range) without any measures to prevent bighorn sheep contact. Bighorn are highly susceptible to domestic sheep pathogens. Those pathogens may show no effect on domestic sheep carriers which appear healthy (Jessup 1981). It is likely that bighorn populations in these two ranges would be eventually decimated over the long term.

Forty guzzlers would be constructed in current bighorn sheep habitat in locations that are inaccessible to livestock. This would mitigate some of the previously discussed impacts of competition.

Desert Tortoise

Under the Livestock Production Alternative, livestock grazing would be increased by 20 percent on ephemeral-perennial allotments, which contain 247,200 acres of tortoise crucial habitat. Livestock grazing would be allowed on previously ungrazed allotments containing 104,300 acres of tortoise crucial habitat. No ephemeral inspections, reservations of forage, or consideration of other resources in licensing livestock use would be used to meet the nutrient requirements of tortoises on all 486,200 acres of crucial habitat in the county. Over the long term, tortoise populations could be expected to decline because reproduction would be suppressed from inadequate forage. Trampling of burrows and tortoises would also increase.

Gambel's Quail

Approximately 653,050 acres of crucial quail habitat are located in grazing allotments proposed for ephemeral-perennial classification and a 20 percent increase in livestock use over past average levels. Increased concentrated use by livestock around water sources would result. Quail are dependent on the vegetation around such waters in the summer when succulent vegetation is unavailable. A reduction in quail populations will result in the short term.

There are 107,200 acres of crucial quail habitat in those previously ungrazed allotments that may be applied for and grazed under this alternative. No ephemeral inspections or consideration of other resource needs in licensing livestock use would occur on any of the allotments. Increased livestock use will reduce quail food and cover. Over the long term, quail populations would be reduced, particularly in drought periods when competition with livestock compounds the stresses imposed.

Other Wildlife

At least for the short term, livestock use would be increased 20 percent over present levels in

ephemeral-perennial allotments. Desert washes in these allotments would have additional concentrated use. These important wildlife habitats provide structural and food plant diversity that support higher numbers of many nongame wildlife species than the surrounding desert. Increased livestock use would remove food and cover plants for many birds. Nests of ground-nesting species would be more susceptible to trampling from livestock.

The riparian habitat associated with 18 springs which are presently being trampled by livestock or wild horses or burros would not be protected under this alternative. Degradation of these small but important habitats would continue. A 20 percent increase in AUMs may force livestock to seek water sources that currently are only lightly used. Associated riparian areas would deteriorate, reducing the capacity to support the many dependent wildlife species.

Ephemeral grazing, without field inspections or considerations for other resource needs, would be allowed on 15 allotments that are currently ungrazed. Deterioration of habitat would occur over both the short and long term a half-mile or more around water sources. Livestock grazing would occur on approximately 55,000 acres of elk habitat in the Spring Mountains where no livestock grazing currently exists. Increased competition for the limited summer forage available may eliminate the small population (50 animals) of elk over the long term.

Wild Horses and Burros

Impacts to the remaining animals from reducing by 50 percent the herds in the Gold Butte, Muddy Mountain, and Eldorado herd use areas would be as described in the Proposed Action.

Impacts to removed animals would be the same as those discussed for the Proposed Action.

Horse and burro numbers in the Spring Mountain herd use area will not be reduced, however, increased grazing pressures to these animals could be anticipated. This impact would be most pronounced for the Lucky Strike/Kyle Canyon wild horse band and the Wheeler Wash/Wheeler Slope burro band where licensing of ephemeral use by livestock without field inspection, together with a 20 percent increase in perennial livestock AUMs, on the Lucky Strike and Wheeler Wash allotments would increase forage conflicts between livestock and the wild horses and burros. These two band areas also lie within two allotments previously unused by livestock, but available for application under this alternative, Kyle Canyon and Wheeler Slope. Livestock use in these band areas would increase, especially during the spring months, consequently increasing forage competition among livestock and wild horses and burros in these areas.

Livestock use of ephemeral forage could also be applied for on the previously unused Roses Spring and Spring Mountain allotments, where two horse, two burro, and one horse and burro band in the Spring Mountain herd use area could be affected. Impacts to these bands would be similar to those expected to be incurred by the Lucky Strike/Kyle Canyon and Wheeler Wash/Wheeler Slope bands due to ephemeral licensing.

As funding becomes available in the long term, impacts to wild horses and burros from development of range improvement projects on intensively managed allotments would be the same as those identified for the Proposed Action.

Livestock Grazing

Under the Livestock Production Alternative, an immediate beneficial impact to livestock operations would occur on the 16 ephemeral-perennial allotments. With the increased livestock use, however, monitoring would probably indicate overuse. Livestock numbers would then be adjusted down to proper use levels, to insure sustained-yield forage production, and eventual proper stocking levels. Any immediate beneficial impacts would be negated by short-term reductions to compensate for overuse.

The long-term impacts would be the same as discussed in the Proposed Action.

No changes would occur in the livestock operations on the ephemeral allotments.

Other Uses

Initiation of livestock grazing on the 15 currently ungrazed allotments would also begin the use conflicts identified in Table 1-3 which are not now occurring. These use conflicts would have the strongest impacts where intensive human use is now occurring, e.g., Las Vegas Valley; Spring Mountain allotment, which includes Red Rock Canyon Recreation Lands; Kyle Canyon allotment which includes many private homes and a well-traveled highway; and Overton Arm, which has access into the main part of the town of Overton.

Economics

Rancher Economics

The Livestock Production Alternative will increase the number of AUMs available to the rancher on allotments reclassified ephemeral-perennial. Ranchers with allotments remaining classified ephemeral would not be impacted.

The upward adjustment in livestock numbers will be discussed by ranch-size category:

Small Ranches: A 20 percent increase in numbers would increase the rancher's cash flow by an amount equivalent to the increase in gross income, since sales would have increased while expenses remain relatively flat. This net income would still be below the break-even level. A temporary decrease in income would happen when the rancher increases the number of cows in the herd by retaining additional heifers or purchasing cows.

Medium Ranches: A 20 percent increase in animal numbers would result in an increase in cash flow of $1,717 annually, to $5,596 (see Appendix Table D-6). The rancher is most interested in the return on labor and capital, which shows a positive increase of $1,717 to $3,530 (see Appendix Table D-6). Like the small rancher, the medium rancher would show income loss during the period when herd size is increased, but this would be temporary and over the long term it would be insignificant.

Large Ranches: This size operation would receive significant benefit from increased animals, assuming fixed costs remain constant and level with past production. This operator would experience an increase in cash flow of $6,439 (see Appendix Table D-7). Return on capital and labor would climb from $3,871 to $10,310, an increase of $6,439. This operator would also experience a decline in income while the herd numbers are being increased, but it would be temporary in nature and not significant.

Rancher Net Worth

The increase in AUMs on the 16 Nevada-administered ephemeral-perennial allotments would be 4,831 AUMs, resulting in increases to net worth estimated at a combined total of $120,775. These changes to net worth are significant to the individual, but insignificant to the sector and county levels of net worth.

These changes to rancher income and rancher net worth are only in the short term. During the long term, the livestock production impact will become similar to the Proposed Action.

Wildlife Economics

Bighorn sheep will be negatively impacted by the increased livestock numbers, and by increased mortality rates caused by contact with domestic sheep diseases in the Bunkerville and Christmas Tree Pass allotments. These short-term negative benefits are calculated from the elimination of hunting from both bighorn sheep herds. The amount of hunting reduction has an associated value of $666, based on current populations of 86 bighorn sheep in the Newberry Mountains and 32 bighorn in the Virgin Mountains.

In addition to disease, competition with livestock will be increased on 30.6 percent of crucial bighorn sheep habitat. This will further reduce hunter-day values by 30.6 percent from the current value of $7,420, or $2,271. The net decrease in values derived from bighorn sheep is $2,937 annually for the short term.

In the long term, bighorn sheep guzzlers will be installed to mitigate these short-term adverse impacts. No positive or negative benefits are calculated for bighorn sheep in the long term.

Small game will be negatively impacted by the increased competition with livestock. The decline in small game hunter-day values will be 20 percent of the decline of a dry year. This decline will be 20 percent of $596,800, or $119,360 (se Appendix C). This decrease is projected only during the short term, after which monitoring and CRMP will adjust the numbers to proper levels.

Benefit/Cost Analysis

The Livestock Production Alternative shows a negative net benefit of over $1.2 million (see Appendix Table D-8).

Although both the Proposed Action and the Livestock Production Alternative may be equivalent in the long term, the Livestock Production Alternative will never reach better than a 0 to 1 benefit/cost ratio. In addition, the negative impacts of the Livestock Production Alternative may be greater in the long term than those of the Proposed Action, and the positive benefits per year during the long term may occur at a slower rate.

Social Well-Being

See Table 3-6 and the discussion under Social Well-Being for the Proposed Action.

ENVIRONMENTAL CONSEQUENCES OF THE NATURAL RESOURCE PROTECTION ALTERNATIVE

Vegetation

Ephemeral Plants

Impacts would be the same as those discussed under the Proposed Action.

Ungrazed Allotments

Impacts would be the same as those discussed under the Proposed Action.

Perennial Plants - Short Term

The Natural Resource Protection Alternative would provide an immediate short-term 20 percent reduction in the utilization rate of perennial forage on the 16 ephemeral-perennial allotments as compared with the Proposed Action. Monitoring studies in the short term would indicate if the utilization of 19,327 AUMs was within the moderate grazing levels established by the Nevada Range Studies Task Group (1981). If not, adjustments in livestock numbers or other factors would be made in the short term.

It is not likely that dramatic changes to livestock forage condition would occur in the short term (Stoddart et al. 1975; Holmgren and Hutchings 1972).

Perennial Plants - Long Term

With the grazing systems, AMPs, and range improvements identified for this alternative, improvement to livestock forage condition as described in the Proposed Action (see Table 3-1) would occur. The improvement, however, would occur at a faster rate because of the reduced grazing level initially. Van Poollen and Lacey (1979) observed that production of herbaceous material was greater with a reduction in utilization from moderate to light within a grazing system than if the change was from heavy to moderate utilization.

The impacts to vegetation in the Gold Butte herd use area would be as described in the Livestock Production Alternative.

Desert Wash and Riparian Vegetation

The improvements described in the Proposed Action would also occur under this alternative.

Wildlife

The impacts to wildlife under the Natural Resource Protection Alternative would be the same as described under the Proposed Action with the following exceptions. Grazing by livestock county-wide would be reduced by 20 percent from the previous five-year-average licensed use to begin monitoring. This would prevent overutilization to some extent from occurring during the three years of monitoring needed to determine proper utilization levels. A short-term benefit to most wildlife species, including bighorn sheep, desert tortoise, and gambel's quail, should result from increased food and cover.

Because domestic sheep grazing would no longer be allowed in the Bunkerville and Christmas Tree Pass allotments, bighorn sheep populations in the Virgin and Newberry Mountains would no longer be threatened with possible disease from domestic sheep contact. This would be both a short- and long-term benefit.

Forage reservations determined through the CRMP process would be accomplished to meet desert tortoise needs. Forage being made available during the critical spring period for tortoise should encourage reproductive activity and insure population viability over the long term.

Wild Horses and Burros

The burro herd in the Gold Butte herd use area will be reduced by 250 animals, which is 50 percent of the current wild burro population in the area. This action would probably have a beneficial impact to this herd, for the reasons discussed in the Proposed Action. Impacts to the removed burros will also be the same as those identified in the Proposed Action.

By licensing livestock in the 16 ephemeral-perennial allotments at 20 percent below five-year-average use levels, conflicts caused by grazing competition would be reduced in the Muddy Mountain and Eldorado herd use areas. In the Spring Mountain herd use area, horses and burros will benefit from a reduction in livestock AUMs on the Lucky Strike and Wheeler Wash allotments.

Strict field inspections of ephemeral forage with consideration of other resource uses prior to licens-

ing additional ephemeral livestock AUMs on all grazing allotments should mitigate any additional impacts to wild horse and burro herds caused by competition with livestock.

Impacts over the long term due to development of range improvement projects as part of AMPs and grazing systems will be the same as those identified for the Proposed Action.

Livestock Grazing

Ephemeral Allotments

Impacts to livestock operations on the 16 ephemeral allotments would be comparable to those described under the Proposed Action.

Ungrazed Allotments

Impacts under this alternative would be the same as under the Proposed Action.

Ephemeral-Perennial Allotments - Short Term

Short-term adverse impacts would occur to operators on the 16 ephemeral-perennial allotments. Initial grazing use on the allotments would be 4,831 AUMs below the past five-year-average licensed use, a reduction of 15.6 percent of the total AUM harvest in Clark County.

Ephemeral-Perennial Allotments - Long Term

Long-term impacts to livestock operations on the 16 ephemeral-perennial allotments would be the same as under the Proposed Action.

Economics

Rancher Economics

The five ephemeral yearlong operators in the county may be forced out of business during a dry year under the Natural Resource Protection Alternative. However, the forage resource would remain available to an entrepreneur able to make profitable use of it. In addition, the 16 ephemeral-perennial operators would suffer a 20 percent loss of AUMs.

The impacts of the downward adjustment in numbers will be discussed by ranch-size category.

Small Ranches: A 20 percent decline in herd size would decrease the income from a small operation by 20 percent, since sales would decline and costs would remain fixed. Since these operators are influenced by considerations other than economics, it is impossible to calculate how many operators may choose to leave the industry. It is possible that income would not equal fixed costs. The operator would realize no return for his labor and would have to subsidize his ranching operation from his other income.

Medium Ranches: A 20 percent decrease in animal numbers would result in a decrease in cash flow of $2,476 annually to $1,403 (see Appendix Table D-6). (The size of this decrease does not equal the increase in cash flow from a 20 percent increase in AUMs because of the relative impacts of fixed costs per animal unit.) The return on capital and labor declines by $2,476 to give a loss of $663 for the year. This decreased return on investment and labor may have such a detrimental impact upon individuals, that they could consider leaving the industry. However, the operator would have to weigh that course against all the social and unquantifiable economic returns to each individual mentioned in Chapter Two.

Large Ranches: This size operation would receive significant loss from a 20 percent decrease in herd size. Net cash flow would decrease by $6,440 to $5,649, the return on capital and labor investment (see Appendix Table D-7). This condition would remain during the short term but may be altered in the long term by decreasing fixed costs. However, lost monies would not be recovered, and a smaller net cash flow would result from a lower herd size, even following adjustment in fixed assets. It is unknown if loss sustained in the short term would force any large operators out of business, although a herd of 300 animals is considered minimal size and a 20 percent decrease may force several operators below that break-even point. Since all but these four large-ranch operators in Clark County are now below this break-even point and continue to operate, it is inappropriate to speculate as to the number of large operators who would go out of or remain in business.

Rancher Net Worth

The decrease in AUMs on the five ephemeral allotments and the 16 ephemeral-perennial allotments is 9,191 AUMs. The rancher net worth will decline by $229,775. These impacts are significant to the individuals involved but insignificant in the total net worth in Clark County.

Wildlife Economics

Increased income from hunting is expected, resulting from increased populations of bighorn sheep and small game animals.

Bighorn sheep populations are expected to increase to reasonable numbers in both current and historic habitat, but at a slower rate than under the No Livestock Grazing Alternative. This will provide an additional 203 tags with an associated annual value of $284,600. An additional 24 people will become involved as hunting guides for sheep on BLM-administered lands. These benefits are expected to occur equally over the long term.

The Natural Resource Protection Alternative will create annual benefits of $118,300 from increases in small game hunting. These benefits will accrue equally over the short term. The costs are estimated to the same as those in the Proposed Action and the Livestock Production Alternative.

Benefit/Cost Analysis

The present-value cost of all proposed AMPs and HMPs would be $633,489. Anticipated present-value benefits would be $1,618,228 (see Appendix Table D-9). The benefit-to-cost ratio is 2.55 to 1 ($1,618,228 to $633,489).

Social Well-Being

See Table 3-7 and the discussion under Social Well-Being in the Proposed Action.

TABLE 3-1

PROPOSED ACTION, LIVESTOCK PRODUCTION ALTERNATIVE,
AND NATURAL RESOURCE PROTECTION ALTERNATIVE -
CHANGES TO LIVESTOCK FORAGE CONDITION IN CLARK COUNTY

	Livestock Forage Condition			
	Good	Fair	Poor	Unclassified
Present Acres	103,700	414,700	3,065,600	26,800
Decrease	0	- 90,000	- 243,000	0
Increase	+ 90,000	+243,000	0	0
Net Change in Acres*	90,000	153,000	<243,000>	0
Percent Change in Condition Class	87%	37%	8%	None
Percent Change in Forage Condition on BLM-Administered Lands In Clark County	2%	4%	7%	None
Net Result Acres	193,700	567,700	2,822,600	26,800

* Net improvement in livestock forage condition is 333,000 acres, or 9 percent of BLM-administered acreage in Clark County.

Source: Clark County EIS Team 1981.

TABLE 3-2

ANTICIPATED PERCEPTIONS BY SELECTED INTEREST GROUPS OF
THE IMPACT OF THE PROPOSED ACTION IN CLARK COUNTY ON THEIR INTERESTS

Affected Interests	Vegetation	Livestock Grazing	Desert Bighorn Sheep	Desert Tortoise	Quail	Wild Horses and Burros	Economics
Wild Horse and Burro Groups						B	
Livestock Groups		A				B	B
Individual Livestock Operators	B	B(30) A(5)				B	B(30) A(5)
Bighorn Sheep Groups			B			B	
Desert Tortoise Groups	B			B			
Conservation Groups	B	A	B			B	
Bighorn Sheep Guides			B(11)				B(11)
Small Game Hunters	B				B		B
Moapa-Virgin Valley Communities		A				B	
Service Communities		A				B	

A - Adversely impacted.
B - Beneficially impacted.
No notation represents no perceived impact, either by the interest group or by BLM.
(5) - Number of individuals.

Source: Clark County EIS Team 1981.

TABLE 3-3

ANTICIPATED PERCEPTIONS BY SELECTED INTEREST GROUPS OF
THE IMPACT OF THE NO ACTION ALTERNATIVE IN CLARK COUNTY ON THEIR INTERESTS

Affected Interests	Vegetation	Livestock Grazing	Desert Bighorn Sheep	Desert Tortoise	Quail	Wild Horses and Burros	Economics
Wild Horse and Burro Groups	A					A	
Livestock Groups		B				A	B
Individual Livestock Operators		B(All)				A	B
Bighorn Sheep Groups	A	A	A		A	A	A
Desert Tortoise Groups	A	A	A	A		A	
Conservation Groups	A	A	A	A	A	A	A
Bighorn Sheep Guides		A	A				A
Small Game Hunters	A	A			A	A	A
Moapa-Virgin Valley Communities		A				A	
Service Communities		A				A	

A - Adversely impacted.
B - Beneficially impacted.
No notation represents no perceived impact, either by the interest group or by BLM
(7) - Number of individuals.

Source: Clark County EIS Team 1981.

TABLE 3-4

NO LIVESTOCK GRAZING ALTERNATIVE -
CHANGES TO LIVESTOCK FORAGE CONDITION IN CLARK COUNTY

	Livestock Forage Condition			
	Good	Fair	Poor	Unclassified
Present Acres	103,700	414,700	3,065,600	26,800
Decrease	0	- 24,000	- 331,000	0
Increase	+ 24,000	+ 331,000	0	0
Net Changes in Acres*	24,000	307,000	<331,000>	0
Percent Change in Condition Class	23%	74%	11%	None
Percent Change in Forage Condition on BLM-Administered Acres In Clark County*	1%	9%	9%	None
Net Result Acres	127,700	721,700	2,734,600	26,800

* Net improvement in livestock forage condition is 355,000 acres, or 10 percent of BLM-administered acreage in Clark County.

Source: Clark County EIS Team 1981.

TABLE 3-5

ANTICIPATED PERCEPTIONS BY SELECTED INTEREST GROUPS OF
THE IMPACT OF THE NO LIVESTOCK GRAZING ALTERNATIVE IN CLARK COUNTY ON THEIR INTERESTS

Affected Interests	Vegetation	Livestock Grazing	Desert Bighorn Sheep	Desert Tortoise	Quail	Wild Horses and Burros	Economics
Wild Horse and Burro Groups	B					B	
Livestock Groups		A	A	A		A	A
Individual Livestock Operators		A(All)	A	A		A	A
Bighorn Sheep Groups	B	B	B			B	B
Desert Tortoise Groups	B	B	B	B		B	
Conservation Groups	B	B	B	B	B		
Bighorn Sheep Guides	B	B	B				B
Small Game Hunters	B	B			B		B
Moapa-Virgin Valley Communities		A		A		A	A
Service Communities		A		A		A	A

A - Adversely impacted.
B - Beneficially impacted.
No notation represents no perceived impact, either by the interest group or by BLM.
(7) - Number of individuals.

Source: Clark County EIS Team 1981.

TABLE 3-6

ANTICIPATED PERCEPTIONS BY SELECTED INTEREST GROUPS OF
THE IMPACT OF THE LIVESTOCK PRODUCTION ALTERNATIVE IN CLARK COUNTY ON THEIR INTERESTS

Affected Interests	Vegetation	Livestock Grazing	Desert Bighorn Sheep	Desert Tortoise	Quail	Wild Horses and Burros	Economics
Wild Horse and Burro Groups	B					A	
Livestock Groups		B		B		B	B
Individual Livestock Operators		B(All)		B		B	B(All)
Bighorn Sheep Groups		A	A			B	A
Desert Tortoise Groups		A		A		B	
Conservation Groups	A	A	A	A	A	B	A
Bighorn Sheep Guides		A	A				A
Small Game Hunters		A			A		A
Moapa-Virgin Valley Communities		B				B	B
Service Communities		B				B	B

A - Adversely impacted.
B - Beneficially impacted.
No notation represents no perceived impact, either by the interest group or by BLM.
(7) - Number of individuals.

Source: Clark County EIS Team 1981.

TABLE 3-7

ANTICIPATED PERCEPTIONS BY SELECTED INTEREST GROUPS OF
THE IMPACT OF THE NATURAL RESOURCE PROTECTION ALTERNATIVE IN CLARK COUNTY ON THEIR INTERESTS

Affected Interests	Vegetation	Livestock Grazing	Desert Bighorn Sheep	Desert Tortoise	Quail	Wild Horses and Burros	Economics
Wild Horse and Burro Groups	B					B	
Livestock Groups		A	A	A		A	A
Individual Livestock Operators		A(21)	A	A		A	A(21)
Bighorn Sheep Groups		B	B				B
Desert Tortoise Groups		B		B		A	
Conservation Groups	B	B	B	B	B	B	B
Bighorn Sheep Guides		B(24)	B				B(24)
Small Game Hunters		B			B		B
Moapa-Virgin Valley Communities		A				A	A
Service Communities		A				A	A

A - Adversely impacted.
B - Beneficially impacted.
No notation represents no perceived impact, either by the interest group or by BLM.
(11) - Number of individuals.

Source: Clark County EIS Team 1981.

CHAPTER FOUR

LIST OF PREPARERS

Edward T. Ciliberti - EIS Team Leader and responsible for social analysis

B.A. (1963) English from St. Peter's College, New Jersey

Experience: 10 years with the U.S. Army as Infantry Officer with both command and staff responsibilities, 4 years as public affairs officer and 1 year as Chief of Planning and Environmental Assistance with the Bureau of Land Management in the Las Vegas District.

Fred R. King - responsible for the economics section

A.S. (1967) General Science from Snow College, Utah

B.S. (1972) Economics from Utah State University

Experience: 6 years as branch manager for Valley Bank in Mesquite, Nevada, 2 years as business manager for the Moapa Paiute Reservation, and 1 year as regional economist for the Bureau of Land Management in the Las Vegas District.

Lois Kvool - EIS Word Processor Operator

Training (1 year) in word processing concepts, Clark County Community College, Nevada

Experience: 1 1/2 years as clerk/typist with the U.S. Air Force in Nevada, 1 year as secretary to the Director of the Nellis AFB American Red Cross Chapter in Nevada, and 1 1/2 years as editorial clerk with the Bureau of Land Management in the Las Vegas District.

Louis Pizatella - responsible for vegetation and livestock grazing sections

B.S. (1977) Range Management from California State University at Chico

Experience: 1 year as forestry/range aid with the U.S. Forest Service in Austin, Nevada, and 3 years as range conservationist with the Bureau of Land Management in the Las Vegas District.

Roy Price - responsible for the wildlife section

B.S. (1975) Wildlife Management, minor in Range Management, from University of Nevada at Reno

Experience: 1/2 year as wildlife technician with the Bureau of Land Management in the Battle Mountain District, 2 years as range conservationist and 3 years as wildlife biologist with the BLM in the Las Vegas District.

Steve Rasmussen - responsible for cartography

Experience: 11 years as visual information specialist with the Bureau of Land Management in the Nevada State Office.

Anna Rubin - responsible for the wild horse and burro section

B.S. (1977) Range Management and Wildlife Ecology from University of Florida

Experience: 3 months as range technician with the Bureau of Land Management in New Mexico, and 3 years as range conservationist with the BLM in the Las Vegas District.

Marta L. Witt - EIS Writer/Editor and Technical Coordinator

B.S. (1977) Park and Recreation Resource Management from Michigan State University

Experience: 1 1/2 years as visitor information specialist with the U.S. Forest Service in Utah, 2 years as wilderness specialist and 1 year as technical publications editor with the Bureau of Land Management in the Las Vegas District.

CHAPTER FIVE

PUBLIC PARTICIPATION

CONSULTATION AND COORDINATION

Consultation and coordination with all interested individuals, groups, and agencies has been an important part of the planning process for BLM-administered lands in Clark County, and will continue to play a vital role in the development of the Final EIS and MFP 3, and the implementation of these decisions through Coordinated Resource Management and Planning (CRMP).

In August of 1981, a notice of intent to prepare the Clark County Grazing EIS was published in the *Federal Register*. Letters and scoping/preparation plans were sent to almost 400 individuals, organizations, and agencies, inviting participation in the EIS process. Formal briefings were held for both the Las Vegas and Reno area congressional delegation representatives, the Nevada State Clearinghouse, the Clark County commissioners and staff, and the Las Vegas District Multiple Use Advisory Council.

SCOPING

Scoping workshops were held during August of 1981 in Mesquite, Searchlight, and Las Vegas. These workshops were attended primarily by local livestock operators and focused on informal discussions of the management intensity and allotment reclassification components of the alternatives, including the Proposed Action. A public scoping meeting was held in Las Vegas in early September, signifying the end of the formal scoping process, although contributions from other agencies and individuals continued to be incorporated, when appropriate, as received.

Documentation of comments received as part of the scoping process, and responses by BLM with regard to adjustments in the scope of this analysis, are covered in the publication "Documentation of the Scoping Process," which is being distributed with this DEIS.

INTERAGENCY CONTACTS

Professional contacts have been made with the Nevada Department of Wildlife, National Park Service, U.S. Forest Service, Clark County Department of Comprehensive Planning, various departments of the University of Nevada (Las Vegas and Reno), and other BLM Districts.

Informal consultation on the possible existence of threatened or endangered plants and animals will be scheduled with the U.S. Fish and Wildlife Service.

AVAILABILITY OF THE DRAFT EIS

The Draft Environmental Impact Statement (DEIS) will be sent to all individuals, agencies, and groups who have expressed an interest in the Clark County planning process. Copies of the DEIS will also be sent to local agencies and organizations, and will be available for review at the listed 12 public libraries and 11 BLM offices. Anyone else wishing a copy of a summary or of the complete DEIS may receive one by calling or writing the BLM Las Vegas District at P.O. Box 26569, Las Vegas, NV 89126, (702) 385-6463.

The following will receive copies of the complete DEIS:

Mayor of Boulder City
Mayor of Henderson
Mayor of Las Vegas
Mayor of North Las Vegas
Citizen Advisory Councils/Town Boards (11)

Clark County Commission
Clark County Department of Comprehensive Planning
Clark County Extension Agent
Clark County Conservation District/Soil Conservation Service

Senator Paul Laxalt, Las Vegas
Senator Howard Cannon, Las Vegas
Congressman James Santini, Las Vegas

Bureau of Reclamation
Department of Energy
Environmental Protection Agency

U.S. Fish and Wildlife Service
U.S. Forest Service
National Park Service
Nellis Air Force Base

Nevada Department of Wildlife
Nevada Division of Forestry
Nevada Division of State Parks
Nevada State Clearinghouse, Reno

Las Vegas District Grazing Advisory Board
N-5 Grazing Advisory Board, Caliente
Las Vegas District Multiple Use Advisory Council
Livestock Permittees in Clark County (44)
Nevada Cattlemen's Association
N-5 Unit of the Nevada Cattlemen's Association, Caliente
Nevada Woolgrowers Association

American Horse Protection Association, Washington, D.C.
Animal Protection Institute, California
Audubon Society, Red Rock Chapter
Center for Renewable Natural Resources, UNR
Desert Bighorn Council
Desert Tortoise Council
Fraternity of the Desert Bighorn
Fund for Animals, Inc., New York
Humane Society of Southern Nevada
International Society for the Protection of Mustangs & Burros, Reno
Moapa Business Council
National Mustang Association, Utah
National Wild Horse Association
Natural Resources Defense Council, San Francisco
Nevada Wildlife Federation
Northern Nevada Native Plant Society, Reno
Resource Concepts, Inc., Carson City
Sierra Club, Toiyabe Chapter, Las Vegas and Reno Groups
The Wildlife Society, Nevada Chapter, Reno
Wild Horse Organized Assistance (WHOA), Reno

PUBLIC LIBRARIES

Boulder City Library
539 California Ave.
Boulder City, Nevada 89005

Bunkerville Library
Bunkerville, Nevada 89007

Charleston Heights Library
800 Brush St.
Las Vegas, Nevada 89107

Clark County Community College
Learning Resource Center
3200 E. Cheyenne Ave.
North Las Vegas, Nevada 89030

Clark County Library
1401 E. Flamingo Rd.
Las Vegas, Nevada 89109

Las Vegas Public Library
1762 E. Charleston Blvd.
Las Vegas, Nevada 89104

Moapa Valley Library
Overton, Nevada 89040

North Las Vegas Library
2300 Civic Center Dr.
North Las Vegas, Nevada 89030

Searchlight Library
Searchlight, Nevada 89046

James Dickinson Library
Documents Dept.
University of Nevada
4505 Maryland Parkway
Las Vegas, Nevada 89154

Getchell Library
Govt. Publications Dept.
University of Nevada
Reno, Nevada 89507

Virgin Valley Library
Mesquite, Nevada 89024

BUREAU OF LAND MANAGEMENT OFFICES

Office of Public Affairs, BLM
18th and C Streets, NW
Washington, D.C. 20240

Nevada State Office
300 Booth St.
Reno, Nevada 89520

Battle Mountain District Office
North 2nd and South Scott Streets
Battle Mountain, Nevada 89820

Carson City District Office
1050 E. Williams Street
Carson City, Nevada 89701

Elko District Office
2002 Idaho Street
Elko, Nevada 89801

Ely District Office
Star Route 5, Box 1
Ely, Nevada 89301

Las Vegas District Office
4765 West Vegas Drive
Las Vegas, Nevada 89126

Winnemucca District Office
705 East 4th Street
Winnemucca, Nevada 89445

Arizona Strip District Office
196 East Tabernacle

St. George, Utah 84770

Cedar City District Office
1579 North Main
Cedar City, Utah 84720

Riverside District Office
1695 Spruce Street
Riverside, California 92507

HEARINGS

A public hearing or hearings will be held on the Draft Environmental Impact Statement. Notice for dates, locations, and times for public hearing will be announced in advance to the public news media and in the *Federal Register.*

APPENDICES

APPENDIX A

APPLICATION OF SELECTIVE MANAGEMENT CRITERIA TO CLARK COUNTY ALLOTMENTS

There are 34 allotments in Clark County that are grazed by livestock. These allotments were tentatively categorized as follows.

Maintain Category (1)

One allotment is intended for this category in the short term. The allotment showed a significant amount of perennial forage present in data generated by the Clark County range survey of 1979. It was felt that the area of the allotment producing this forage was at or close to its full potential. Although the overall livestock forage condition was poor, in the perennial-producing site it is good. While the allotment contains crucial desert tortoise habitat, the current operator runs his livestock in a fashion that minimizes the competition for spring ephemeral forage. Overall, the operator has an informal, natural grazing system that is well suited to the general needs of the allotment. This allotment will move to the Maintain category as soon as reclassification to ephemeral-perennial is accomplished.

Improve Category (19)

Fifteen other allotments also had showings of perennial forage in the range survey or were considered by range conservationists to have the potential to develop a perennial forage base. In all cases, the overall condition of the allotments was poor, but it was felt that intensive management could improve that. The present management is unsatisfactory in that an existing or potential perennial base is being managed under ephemeral grazing rules. While that may be responsive to short-term forage availability, long-term improvement of the perennial livestock forage condition and production is not being sought. All 15 allotments have serious resource conflicts, including both bighorn sheep and desert tortoise crucial habitat. Eight have riparian areas being degraded by livestock or wild burro use and six contain major desert washes receiving concentrated livestock grazing pressure.

Two allotments are in fact small portions of allotments administered by the Arizona Strip District. That district has already determined that its larger portion of the allotments would be classified ephemeral-perennial and managed intensively. Las Vegas District has matched that decision on its smaller portion.

One ephemeral allotment has a serious conflict with bighorn sheep. Although it has no potential for perennial forage production, it should be managed intensively in the short term to resolve the bighorn sheep problem. This will not be a major CRMP effort since it can be treated in conjunction with two neighboring ephemeral-perennial allotments which share the bighorn sheep problem. It is a readily resolvable short-term problem. This allotment would revert to the Custodial category when the problem is solved.

One ungrazed allotment has several springs with associated riparian areas which are being degraded by wild burros. Resolution of that situation would be accomplished in the short term. Upon resolution, it would be dropped from the Improve category.

Custodial Category (15)

These 15 allotments are all in poor livestock forage condition primarily because they have little or no perennial forage and no potential for producing any. If grazed at all, ephemeral grazing is the proper management class. Only three have resource conflicts and these are limited in the sense that appropriate ephemeral grazing practices will provide the desert tortoise that are present with necessary spring ephemeral forage. Under these conditions, ephemeral management is the only logical choice.

APPENDIX B

METHODOLOGY FOR PREDICTING CHANGE TO LIVESTOCK FORAGE CONDITION IN CLARK COUNTY

Changes to vegetation caused by the Proposed Action and alternatives were determined by the analysis of livestock forage condition and apparent trend. Based upon studies of allotments managed under AMPs in the Bureau of Land Management's Shivwits and Vermillion Resource Areas in the Arizona Strip District, and in the Las Vegas District, assumptions were made about the responses of vegetation to intensive management and custodial management.

Under intensive management, increases to key species can be expected in mid-grass bunch, perennial forb, and fourwing saltbush vegetation types. The following types would not be expected to improve when in poor condition: sagebrush, pinyon-juniper, desert-shrub, creosotebush, blackbrush, mountain-shrub, conifer, and shadscale. Because of the climatic and species composition differences between Clark County and the Arizona Strip District, the projection was made that under intensive management, a 15 percent change to key species would take approximately 35 years. Over 90 percent of the acreage in Clark County was shown in the 1979 range survey to be in poor condition with very low percentages of desirable and intermediate species. If a 15 percent change in composition would occur, many of these acres would remain in poor condition since 40 percent or more of both desirable and intermediate species is needed to classify an area as good condition range. However, if a change of 15 percent would occur, trend would then change from static or downward to upward, indicating improvement of the range. As a result of the above-mentioned changes the following projections were made:

1. Under intensive management, key species would increase by 15 percent in those areas where at least five percent of the composition is desirable species, in 35 years. Improvement would be expected in mid-grass, perennial forb, and fourwing saltbush vegetation types. Little change would be expected in sagebrush, pinyon-juniper, desert-shrub, creosotebush, blackbrush, mountain-shrub, conifer, and shadscale.

2. Under custodial management, little or no change would occur to condition or trend. Areas with apparent static trend would remain the same.

3. Under no livestock grazing, little change to condition and trend would be expected. Intensively grazed areas at watering sites would improve. Areas where desirable species are present would improve slightly over 35 years.

APPENDIX C

WILDLIFE ECONOMICS ANALYSIS

The value of small game is estimated from the information provided by the Nevada Department of Wildlife (NDW). It is estimated that quail hunting constitutes 40 percent of the total small game hunting in Clark County and that 13 percent of the quail population is harvested by hunters annually (Lee, NDW, personal communication, 1981). Based on the data from NDW about the quail harvests from 1961 to 1980, a linear regression model was calculated incorporating changes in quail population to estimate small game hunting.

The Nevada Statewide Comprehensive Outdoor Recreation Plan (Nevada State Park System 1977) estimates a value of $35 per hunter-day.

These data allow the calculation of a 20-year-average annual value of small game hunting of $903,900, an average annual dry-year value of $307,300, and an average annual wet-year value of $1,495,400 (see Appendix Table C-1).

APPENDIX D

RANCHER ECONOMICS ANALYSIS

This Appendix is comprised of three types of tabular data. Appendix Tables D-1 and D-2 present detailed ranch budgets for medium and large ranches in Clark County. Three studies from neighboring areas were averaged to project budgets for Clark County: 1) the Shivwits Grazing EIS (1979) analysis for adjacent Mohave County, Arizona; 2) the Caliente Grazing ES (1979) analysis for the southern portion of adjacent Lincoln County, Nevada; and 3) a study done by Resource Concepts, Inc. (1981) under contract to the U.S. Air Force on the impacts of the proposed MX missile system on a region that included parts of Lincoln, Esmeralda, and Clark Counties in Nevada.

Appendix Tables D-6 and D-7 show what happens to the ranch budgets when herds are increased and reduced by 20 percent, as projected for the Livestock Production Alternative and the Natural Resource Protection Alternative.

Appendix Tables D-3 through D-5, D-8, and D-9 illustrate the analyses and calculations performed to arrive at benefit/cost projections for each of the alternatives.

APPENDIX E

CHANGE AND SOCIAL WELL-BEING

Social well-being of individuals and groups is a complex welter of actions, effects, and perceptions. Change that affects some facet of our lives, as indi-

viduals or as a group, is a primary source of impacts to our social well-being.

Change is a constant dimension in life. The importance of change is relative to a whole host of factors. They involve both the relative force of the change agent, the magnitude of the change, the susceptibility of the subject to the change, the capability of the subject to assimilate the change, and, finally, the subject's perception of the effect of the change on him or her.

People are assaulted daily by hundreds of changes. The vast majority of them are so miniscule that our systems, mentally and physically, deal with them automatically. Their impacts, even in aggregate, are unimportant. At the other extreme are changes of such magnitude in our lives that for some they are traumatic: loss of employment, accidents, a major job promotion, and the like.

In between lie a variety of changes that impact us with a variety of intensities. The closer the impact comes to the basics of our lives (food, shelter, family, etc.), the stronger is our reaction to it. As it deals with our avocations and outside interests, our reactions may be as strong but of less sustaining depth.

Calculating the significance of the impact of change on social well-being is a largely futile task. The variations are as many as there are persons impacted.

A final consideration in gauging impact is the method by which change occurs. Ones that arise from a deliberate, consultative process in which the subject is fully involved, tend to be less threatening, more acceptable. It leaves the subject with a sense of control, a reassuring feeling. If the impacts to well-being are adverse, there is at least time and effort given to the subject to prepare for the change and to order his or her affairs so as to best deal with the situation.

Change that is imposed from outside, however, is threatening. It encourages fear of the unknown, a sense of helplessness, even panic at the prospects of damage to well-being. Some may cower; others may resolve to resist at all costs. The change, whether for good or ill, will not occur easily; it may not, in the long run, occur at all.

APPENDIX F

CLARK COUNTY RANGE SURVEY

During 1979 a weight-estimate range survey was made on the 3.6 million acres of public land in Clark County. The survey indicated 89 percent of the acreage to be in poor livestock forage condition, 8 percent in fair, and 3 percent in good condition. It indicated 94 percent to be in apparent static trend, 4 percent in downward, and 2 percent in upward. The survey also indicated varying amounts of suitable and potentially suitable perennial forage on some allotments.

The data from the survey regarding the existence of perennial forage, along with climatic and elevational data, have been used to make initial recommendations (MFP 2 and the Proposed Action) for reclassification of certain allotments from ephemeral to ephemeral-perennial and retention of others as ephemeral. The data related to livestock forage condition and trend have been used to aid in the analysis contained in this EIS.

Production data in the range survey have not been used as a forage allocative tool. Because of the long use of perennial forage on an ephemeral basis, coupled with the climatic extremes of southern Nevada, the production data generated by the range survey may not truly reflect the capacities of the range when perennial usage is appropriately managed. Consequently, stocking levels for perennial usage and periods-of-use on perennial forage will be established on those allotments reclassified to ephemeral-perennial management based on utilization data to be generated through monitoring, rather than through the production data gathered during the range survey. Moreover, experience indicates that use of a one-point-in-time range survey is not, by itself, an adequate basis to determine range carrying capacity and final range stocking rates.

APPENDIX TABLE C-1

ESTIMATED VALUE OF SMALL GAME HUNTING IN CLARK COUNTY

Year	Estimated Quail Population	No. of Quail Harvested	No. of Hunters	Estimated Quail Hunter-Days	Estimated Quail Total Value @ $35/Day	Estimated Small Game Hunter-Days	Estimated Small Game Total Value @ $35/Day
1961	317,700	41,310	2,397	8,960	$ 313,600	22,400	$ 784,000
1962	111,000	14,490	1,540	5,360	187,600	13,400	469,000
1963 (1)	57,600	7,488	1,404	3,540	123,900	8,850	309,800
1964 (1)	38,100	4,961	781	2,240	78,400	5,600	196,000
1965	102,800	13,364	1,586	4,330	151,600	10,830	379,100
1966	306,100	39,798	2,772	9,010	315,400	22,530	788,600
1967	244,900	31,836	2,700	10,110	353,900	25,280	884,800
1968	458,200	59,563	4,561	15,600	546,000	39,000	1,365,000
1969	267,600	34,788	3,575	14,450	505,800	36,130	1,264,600
1970	100,600	13,080	2,475	9,190	321,700	22,980	804,300
1971 (1)	53,700	6,986	1,301	3,630	127,100	9,080	317,800
1972 (1)	38,000	4,948	1,083	3,250	113,800	8,130	284,500
1973 (1)	68,500	8,909	1,518	4,890	171,200	12,230	428,100
1974	188,200	24,460	3,120	10,580	370,300	26,450	925,800
1975	407,600	52,994	4,043	16,050	561,800	40,130	1,404,600
1976 (2)	238,000	30,941	3,929	14,600	511,000	36,500	1,277,500
1977 (2)	183,400	23,841	3,050	11,330	396,600	28,330	991,600
1978 (2)	305,700	39,750	3,376	12,600	441,000	31,500	1,102,500
1979 (2)	728,700	94,738	5,233	25,810	903,400	64,530	2,258,600
1980 (2)	504,700	65,612	5,317	21,100	738,500	52,750	1,846,300
Annual Average	225,300		2,788	10,330	$ 361,600	25,830	$ 903,900
(1) Dry Year	51,180		1,217	3,510	$ 122,900	8,780	$ 307,300
(2) Wet Year	392,100		4,181	17,090	$ 598,200	42,730	$1,495,400

Source: Nevada Department of Wildlife 1981; Nevada State Park System 1977; Clark County EIS Team 1981.

TABLE D-1

RANCH BUDGET-
COMPARISONS OF COST PER
ANIMAL UNIT FOR MEDIUM RANCHES IN CLARK COUNTY

	BLM Arizona Shivwits EIS	MX Study Resource Concepts Inc.	BLM Caliente ES	Average RCI & BLM Shivwits
Sales				
Heifer Calves	$ 32.59	$ 59.35	$ 25.36	$ 45.97
Steer Calves	57.16	120.46	47.01	88.81
Culls	29.21	61.55	14.81	45.38
Yearlings	8.62	-0-	-0-	4.31
Other (Non-Cash Income)	6.55	-0-	-0-	3.28
Total Cash Sales*	$127.58*	$241.36	$ 87.19	$184.47*
Expenses				
Land Rents	$ -0-	$ -0-	$ -0-	$ -0-
Supplemental Feeds	3.45	15.02	2.12	9.24
Livestock Expenses	.62	1.81	1.09	1.22
Livestock Purchases	2.59	26.76	3.27	14.68
Insurance	3.45	-0-	3.72	1.73
Labor	4.15	3.61	-0-	3.88
Seed & Fertilizer	.43	-0-	-0-	.22
Machinery Operation	11.21	24.41	7.30	17.81
Repair & Maintenance	5.92	10.29	4.50	8.11
Utilities	3.22	-0-	1.68	1.61
Grazing Fees	17.03	25.72	7.80	21.38
Miscellaneous	13.36	13.53	7.97	13.45
Taxes	3.74	7.66	5.26	5.70
Interest	25.61	78.39	41.58	52.00
Total Cash Expenses	$ 94.78	$207.20	$ 86.29	$151.03
Net Cash Income*	$ 32.80*	$ 34.16	$ .90	$ 33.44*
Depreciation	$ 18.10	$ 30.61	$ 24.16	$ 24.36
Total Expenses	$112.88	$237.81	$110.45	$175.39
Return on Capital & Labor*	$ 21.25*	$ 3.55	$<23.26>	$ 12.36*

* Does not include non-cash income
<$> Negative or loss

Source: USDI, BLM, Arizona Strip District, 1979; RCI 1981; Caliente ES 1979.

TABLE D-2

RANCH BUDGET-
COMPARISONS OF COST PER
ANIMAL UNIT FOR LARGE RANCHES IN CLARK COUNTY

	BLM Arizona Shivwits EIS	MX Study Resource Concepts Inc.	BLM Caliente ES	Average RCI & BLM Caliente
Sales				
Heifer Calves	$ 46.88	$ 59.35	$ 33.50	$ 46.43
Steer Calves	77.41	120.46	59.13	89.80
Cull Cows	20.29	53.91	12.11	33.10
Cull Bulls	-0-	7.6	4.05	5.85
Total Sales	$ 144.58	$ 241.36	$ 108.80	$ 175.18
Expenses				
Land Rents	$ 2.23	$ -0-	$ -0-	$ -0-
Supplemental Feed	9.38	15.02	1.86	8.44
Livestock Expense	1.34	1.81	3.32	2.57
Livestock Purchases	5.36	26.76	6.21	16.49
Insurance	5.36	-0-	2.49	1.25
Labor (Hired)	9.82	3.61	-0-	1.81
Seed & Fertilizer	5.80	-0-	-0-	-0-
Machinery Operation	17.86	24.41	5.51	14.96
Repair & Maintenance	26.79	10.29	5.81	8.05
Utilities	3.35	-0-	1.91	.96
Grazing Fees	12.12	25.72	11.89	18.81
Miscellaneous	11.16	13.53	6.21	9.87
Interest	26.79	78.39	23.91	51.15
Taxes	5.36	7.66	4.90	6.28
Total Cash Expenses	$ 142.72	$ 207.60	$ 74.20	$ 140.64
Net Cash Income	$ 1.86	$ 34.16	$ 34.78	$ 34.54
Depreciation	13.39	30.61	16.34	23.48
Total Expenses	$ 156.11	$ 238.21	$ 90.54	$ 164.12
Return on Capital & Labor	$ <11.53>	$ 3.15	$ 18.26	$ 11.06

<$> Negative or loss

Sources: USDI, BLM, Arizona Strip District, 1979; RCI 1981; Caliente ES 1979.

APPENDIX TABLE D-3

PRESENT VALUE CASH FLOW ANALYSIS
OF THE PROPOSED ACTION IN CLARK COUNTY

Year	Livestock Costs	Wildlife Costs	Total Costs	Livestock Benefits	Wildlife Benefits	Total Benefits	Discount Factor	Present Value of Cost	Present Value of Benefits
1	17,000	40,420	57,420	<12,557>	0	<12,557>	.92915	53,351	<11,686>
2	17,000	40,420	57,420	<12,557>	0	<12,557>	.86332	49,571	<10,841>
3	17,000	40,420	57,420	<12,557>	0	<12,557>	.80216	46,060	<10,072>
4	17,000	40,420	57,420	<12,557>	0	<12,557>	.74533	42,796	<9,359>
5	17,000	40,420	57,420	<12,557>	0	<12,557>	.69252	39,764	<8,696>
6	17,000	40,000	57,000	<12,557>	22,991	10,434	.64346	36,677	6,713
7	17,000	40,000	57,000	<12,557>	45,982	34,425	.59787	34,078	20,581
8	17,000	40,000	57,000	<12,557>	68,972	56,415	.55551	31,664	31,339
9	17,000	40,000	57,000	<12,557>	91,962	79,405	.51616	29,421	40,985
10	17,000	40,000	57,000	<12,557>	114,953	102,396	.47959	28,362	49,108
11	17,000	40,000	57,000	<12,557>	121,381	108,824	.44561	25,399	48,493
12	17,000	40,000	57,000	<12,557>	127,810	115,253	.41404	23,600	47,719
13	17,000	40,000	57,000	<12,557>	134,538	121,682	.38471	21,928	46,812
14	17,000	40,000	57,000	<12,557>	140,667	128,110	.35745	20,374	45,792
15	17,000	40,000	57,000	<12,557>	147,095	134,538	.33213	18,931	44,684
16	17,000	40,000	57,000	<12,557>	153,523	140,966	.30860	17,590	43,502
17	17,000	40,000	57,000	<12,557>	159,952	147,395	.28673	16,343	42,262
18	17,000	40,000	57,000	<12,557>	166,380	153,823	.26642	15,185	40,981
19	17,000	40,000	57,000	<12,557>	172,808	160,251	.24754	14,109	39,668
20	17,000	40,000	57,000	<12,557>	179,236	166,679	.23000	13,110	38,336
21	17,000	40,000	57,000	<12,557>	185,665	173,108	.21371	12,181	36,994
22	17,000	40,000	57,000	<12,557>	192,093	179,536	.19857	11,318	35,650
23	17,000	40,000	57,000	<12,557>	198,522	185,965	.18450	10,516	34,310
24	17,000	40,000	57,000	<12,557>	204,950	192,393	.17143	9,771	32,981
25	17,000	40,000	57,000	<12,557>	211,379	198,822	.15938	9,084	31,688
								631,183	707,944

APPENDIX TABLE D-4

PRESENT VALUE CASH FLOW ANALYSIS
OF THE NO ACTION ALTERNATIVE IN CLARK COUNTY

Year	Livestock Costs	Wildlife Costs	Total Costs	Livestock Benefits	Wildlife Benefits	Total Benefits	Discount Factor	Present Value of Cost	Present Value of Benefits
1	16,600	0	16,600	0	0	0	.92915	15,423	0
2	16,600	0	16,600	0	0	0	.86332	14,331	0
3	16,600	0	16,600	0	0	0	.80216	13,315	0
4	16,600	0	16,600	0	0	0	.74533	12,372	0
5	16,600	0	16,600	0	0	0	.69252	11,496	0
6	17,000	0	17,000	0	0	0	.64346	10,938	0
7	17,000	0	17,000	0	0	0	.59787	10,163	0
8	17,000	0	17,000	0	0	0	.55551	9,443	0
9	17,000	0	17,000	0	0	0	.51616	8,774	0
10	17,000	0	17,000	0	0	0	.47959	8,158	0
11	17,000	0	17,000	0	0	0	.44561	7,575	0
12	17,000	0	17,000	0	0	0	.41404	7,038	0
13	17,000	0	17,000	0	0	0	.38471	6,540	0
14	17,000	0	17,000	0	0	0	.35745	6,076	0
15	17,000	0	17,000	0	0	0	.33213	5,646	0
16	17,000	0	17,000	0	0	0	.30860	5,246	0
17	17,000	0	17,000	0	0	0	.28673	4,874	0
18	17,000	0	17,000	0	0	0	.26642	4,529	0
19	17,000	0	17,000	0	0	0	.24754	4,208	0
20	17,000	0	17,000	0	0	0	.23000	3,910	0
21	17,000	0	17,000	0	0	0	.21371	3,633	0
22	17,000	0	17,000	0	0	0	.19857	3,375	0
23	17,000	0	17,000	0	0	0	.18450	3,136	0
24	17,000	0	17,000	0	0	0	.17143	2,914	0
25	17,000	0	17,000	0	0	0	.15938	2,709	0
								$185,852	0

APPENDIX TABLE D-5

PRESENT VALUE CASH FLOW ANALYSIS
OF THE NO LIVESTOCK GRAZING ALTERNATIVE IN CLARK COUNTY

Year	Livestock Costs	Wildlife Costs	Total Costs	Livestock Benefits	Wildlife Benefits	Total Benefits	Discount Factor	Present Value of Cost	Present Value of Benefits
1	0	42,000	42,000	<88,865>	35,045	<53,820>	.92915	39,024	<50,006>
2	0	42,000	42,000	<88,865>	70,090	<18,775>	.86332	36,259	<16,208>
3	0	42,000	42,000	<88,865>	105,135	16,270	.80216	33,690	13,051
4	0	42,000	42,000	<88,865>	140,180	51,315	.74533	31,303	38,246
5	0	42,000	42,000	<88,865>	175,225	86,360	.69252	29,085	59,806
6	0	35,000	35,000	<88,865>	210,270	121,405	.64346	21,471	78,119
7	0	35,000	35,000	<88,865>	245,315	156,450	.59787	20,925	93,536
8	0	35,000	35,000	<88,865>	280,360	191,495	.55551	19,442	106,377
9	0	35,000	35,000	<88,865>	315,405	226,540	.51616	18,065	116,930
10	0	35,000	35,000	<88,865>	350,450	261,585	.47959	16,785	125,453
11	0	35,000	35,000	<88,865>	385,495	296,630	.44561	15,596	132,181
12	0	35,000	35,000	<88,865>	420,540	331,675	.41404	14,491	137,326
13	0	35,000	35,000	<88,865>	455,585	366,720	.38471	13,464	141,080
14	0	35,000	35,000	<88,865>	490,630	401,765	.35745	12,510	143,610
15	0	35,000	35,000	<88,865>	526,675	437,810	.33213	11,624	145,409
16	0	35,000	35,000	<88,865>	560,720	471,855	.30860	10,801	145,614
17	0	35,000	35,000	<88,865>	595,765	506,900	.28673	10,035	145,343
18	0	35,000	35,000	<88,865>	630,810	541,945	.26642	9,324	144,384
19	0	35,000	35,000	<88,865>	665,855	576,990	.24754	8,663	142,828
20	0	35,000	35,000	<88,865>	700,900	612,035	.23000	8,050	140,768
21	0	35,000	35,000	<88,865>	735,945	647,000	.21371	7,479	138,287
22	0	35,000	35,000	<88,865>	770,990	682,125	.19857	6,949	135,449
23	0	35,000	35,000	<88,865>	806,035	717,170	.18450	6,457	132,317
24	0	35,000	35,000	<88,865>	841,080	752,215	.17143	6,000	128,952
25	0	35,000	35,000	<88,865>	876,125	787,260	.15938	5,578	125,473
								$413,070	2,644,325

TABLE D-6

PROJECTED ANNUAL INCOME VARIANCES
FOR 20% INCREASES AND DECREASES FOR TYPICAL
MEDIUM RANCHES IN CLARK COUNTY

	116 Animal Unit Herd(1)	93 Animal Unit Herd(2)	139 Animal Unit Herd(3)
Sales			
Heifer Calves	$ 5,333	$ 4,275	$ 6,390
Steer Calves	10,302	8,259	12,345
Cull Cows & Bulls	5,264	4,220	6,380
Yearlings	500	400	600
Other (Non-Cash Income)	380	380	380
Total Sales(4)	$ 21,779	$ 17,154	$ 25,643
Expenses			
Supplemental Feeds	$ 1,071	$ 859	$ 1,284
Livestock Expenses	142	113	170
Livestock Purchases	1,703	1,365	2,041
Insurance	201	161	240
Labor (Hired)	450	361	539
Machinery Operation	2,066	1,656	2,476
Repair & Maintenance	941	754	1,127
Utilities	187	150	224
Grazing Fees	2,480	1,988	2,972
Miscellaneous	1,560	1,251	1,870
Seed & Fertilizer	26	20	31
Taxes	661	661	661
Interest	6,032	6,032	6,032
Total Cash Expense	$ 17,520	$ 15,371	$ 19,667
Net Cash Income(5)	$ 3,879	$ 1,403	$ 5,596
Depreciation	$ 2,826	$ 2,826	$ 2,826
Total Expenses	$ 20,346	$ 18,197	$ 22,493
Return on Capital & Labor(4)	$ 1,813	$ <663>	$ 3,530

<$> negative or loss
(1) Represents present size of the herd of a typical medium ranch.
(2) Represents herd size under a 20 percent reduction.
(3) Represents herd size under a 20 percent increase.
(4) Includes non-cash income.
(5) Does not include non-cash income.

Source: Clark County EIS Team 1981.

TABLE D-7

PROJECTED ANNUAL
INCOME VARIANCES FOR 20%
INCREASES AND DECREASES FOR TYPICAL
LARGE RANCHES IN CLARK COUNTY

	350 Animal Unit Herd(1)	280 Animal Unit Herd(2)	420 Animal Unit Herd(3)
Sales			
Heifer Calves	$ 16,251	$ 13,000	$ 19,501
Steer Calves	31,430	25,144	37,716
Cull Cows	11,585	9,268	13,902
Cull Bulls	2,048	1,638	2,457
Total Sales	$ 61,314	$ 49,050	$ 73,576
Expenses			
Supplemental Feed	$ 2,954	$ 2,363	$ 3,545
Livestock Expense	900	720	1,079
Livestock Purchases	5,772	4,617	6,926
Insurance	438	350	525
Labor (Hired)	633	507	760
Machinery Operation	5,236	4,189	6,283
Repairs & Maintenance	2,817	2,254	3,381
Utilities	336	269	403
Grazing Fees	6,584	5,267	7,900
Miscellaneous	3,454	2,764	4,145
Interest	17,903	17,903	17,903
Taxes	2,198	2,198	2,198
Total Cash Expenses	$ 49,225	$ 43,401	$ 55,048
Net Cash Income	$ 12,089	$ 5,649	$ 18,528
Depreciation	$ 8,218	$ 8,218	$ 8,218
Total Expenses	$ 57,443	$ 51,619	$ 63,266
Return on Capital and Labor	$ 3,871	$ <2,569>	$ 10,310

<$> negative or loss
(1) Represents present size of the herd of a typical large ranch.
(2) Represents herd size under a 20 percent reduction.
(3) Represents herd size under a 20 percent increase.

Source: Clark County EIS Team 1981.

APPENDIX TABLE D-8

PRESENT VALUE CASH FLOW ANALYSIS
OF THE LIVESTOCK PRODUCTION ALTERNATIVE IN CLARK COUNTY

Year	Livestock Costs	Wildlife Costs	Total Costs	Livestock Benefits	Wildlife Benefits	Total Benefits	Discount Factor	Present Value of Cost	Present Value of Benefits
1	17,000	41,000	58,000	13,913	<122,297>	<108,384>	.92915	53,891	<100,705>
2	17,000	41,000	58,000	13,913	<122,297>	<108,384>	.86332	50,072	< 93,570>
3	17,000	41,000	58,000	13,913	<122,297>	<108,384>	.80216	46,525	< 86,941>
4	17,000	41,000	58,000	13,913	<122,297>	<108,384>	.74533	43,229	< 80,782>
5	17,000	41,000	58,000	13,913	<122,297>	<108,384>	.69252	40,166	< 75,058>
6	17,000	40,000	57,000	0	<122,297>	<122,297>	.64346	36,677	< 78,693>
7	17,000	40,000	57,000	0	<122,297>	<122,297>	.59787	34,078	< 73,117>
8	17,000	40,000	57,000	0	<122,297>	<122,297>	.55551	31,664	< 67,937>
9	17,000	40,000	57,000	0	<122,297>	<122,297>	.51616	29,421	< 63,124>
10	17,000	40,000	57,000	0	<122,297>	<122,297>	.47959	28,362	< 58,652>
11	17,000	40,000	57,000	0	<122,297>	<122,297>	.44561	25,399	< 54,496>
12	17,000	40,000	57,000	0	<122,297>	<122,297>	.41404	23,600	< 50,635>
13	17,000	40,000	57,000	0	<122,297>	<122,297>	.38471	21,928	< 47,048>
14	17,000	40,000	57,000	0	<122,297>	<122,297>	.35745	20,374	< 43,715>
15	17,000	40,000	57,000	0	<122,297>	<122,297>	.33213	18,931	< 40,618>
16	17,000	40,000	57,000	0	<122,297>	<122,297>	.30860	17,590	< 37,740>
17	17,000	40,000	57,000	0	<122,297>	<122,297>	.28673	16,343	< 35,066>
18	17,000	40,000	57,000	0	<122,297>	<122,297>	.26642	15,185	< 32,582>
19	17,000	40,000	57,000	0	<122,297>	<122,297>	.24754	14,109	< 30,273>
20	17,000	40,000	57,000	0	<122,297>	<122,297>	.23000	13,110	< 28,128>
21	17,000	40,000	57,000	0	<122,297>	<122,297>	.21371	12,181	< 26,136>
22	17,000	40,000	57,000	0	<122,297>	<122,297>	.19857	11,318	< 24,284>
23	17,000	40,000	57,000	0	<122,297>	<122,297>	.18450	10,516	< 22,563>
24	17,000	40,000	57,000	0	<122,297>	<122,297>	.17143	9,771	< 20,965>
25	17,000	40,000	57,000	0	<122,297>	<122,297>	.15938	9,085	< 19,491>
								633,525	<1,292,319>

APPENDIX TABLE D-9

PRESENT VALUE CASH FLOW ANALYSIS
OF THE NATURAL RESOURCE PROJECTION ALTERNATIVE IN CLARK COUNTY

Year	Livestock Costs	Wildlife Costs	Total Costs	Livestock Benefits	Wildlife Benefits	Total Benefits	Discount Factor	Present Value of Cost	Present Value of Benefits
1	17,000	41,820	58,820	<26,470>	23,660	<2810>	.92915	53,723	<2610>
2	17,000	41,820	58,820	<26,470>	47,320	20,850	.86332	49,917	18,000
3	17,000	41,820	58,820	<26,470>	70,980	44,510	.80216	46,380	35,704
4	17,000	41,820	58,820	<26,470>	94,640	68,710	.74533	43,094	51,211
5	17,000	41,820	58,820	<26,470>	118,300	91,830	.69252	40,734	63,594
6	17,000	40,000	57,000	<26,470>	132,530	106,060	.64346	36,677	68,245
7	17,000	40,000	57,000	<26,470>	146,760	120,290	.59787	34,078	71,917
8	17,000	40,000	57,000	<26,470>	160,990	134,520	.55551	31,664	74,727
9	17,000	40,000	57,000	<26,470>	175,220	148,750	.51616	29,421	76,778
10	17,000	40,000	57,000	<26,470>	189,450	162,980	.47959	28,362	78,163
11	17,000	40,000	57,000	<26,470>	203,680	177,210	.44561	25,399	78,966
12	17,000	40,000	57,000	<26,470>	217,910	191,440	.41404	23,600	79,263
13	17,000	40,000	57,000	<26,470>	232,140	205,670	.38471	21,928	79,123
14	17,000	40,000	57,000	<26,470>	246,370	219,900	.35745	20,374	78,603
15	17,000	40,000	57,000	<26,470>	260,600	234,130	.33213	18,931	77,761
16	17,000	40,000	57,000	<26,470>	274,830	248,360	.30860	17,590	76,643
17	17,000	40,000	57,000	<26,470>	289,060	262,590	.28673	16,343	75,292
18	17,000	40,000	57,000	<26,470>	303,290	276,820	.26642	15,185	73,750
19	17,000	40,000	57,000	<26,470>	317,520	291,050	.24754	14,109	72,046
20	17,000	40,000	57,000	<26,470>	331,750	305,280	.23000	13,110	70,214
21	17,000	40,000	57,000	<26,470>	345,980	319,510	.21371	12,181	68,282
22	17,000	40,000	57,000	<26,470>	360,210	333,740	.19857	11,318	66,270
23	17,000	40,000	57,000	<26,470>	374,970	347,970	.18450	10,516	64,200
24	17,000	40,000	57,000	<26,470>	388,670	362,200	.17143	9,771	62,091
25	17,000	40,000	57,000	<26,470>	402,900	376,430	.15938	9,084	59,995
								633,489	1,618,228

GLOSSARY

ACTUAL USE: The use made of available vegetation on any area by livestock and/or wildlife without reference to permitted or recommended use. It is usually expressed in terms of animal unit months (AUMs).

ALLOTMENT: An area designated for the use of a prescribed number and kind of livestock.

ALLOTMENT MANAGEMENT PLAN (AMP): A documented program which applies to livestock operations on the public lands, which is prepared in consultation with the permittee(s) or lessee(s) involved, and which: 1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for the public lands through land use planning; 2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the public lands to meet the livestock grazing and other objectives of land management; and 3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

ANIMAL UNIT (AU): Considered to be one mature cow or its equivalent based upon average daily forage consumption of 25 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM): The amount of forage necessary for the sustenance of one mature cow or its equivalent (e.g., one cow and her calf, four deer, five antelope, five bighorn sheep, five domestic sheep, or one mature horse or burro) for a period of one month.

ANNUAL PLANT: A plant that completes its life cycle and dies within one year or less.

APPARENT RANGE TREND: Professional judgement of apparent change in vegetation and soil erosion characteristics resulting directly from environmental factors, primarily climate and grazing, as observed at one point in time.

ASPECT (VEGETATION): The visual first impression at the time of observation of the dominant or most common species of vegetation in a vegetation type, i.e., pinyon-juniper, big sagebrush.

AUTHORIZED USE: The total number of animal unit months of livestock authorized by permit or license to graze on public lands for each permittee.

AVERAGE LICENSED USE: A mathematical average of the grazing use (stated in AUMs) in a specific physical area for a specified number of years.

BASE PROPERTY: Property (land or water) that has the capability to support authorized livestock for a specified period of the year and has grazing privileges attached to it.

BIGHORN CRUCIAL HABITAT: See Crucial Bighorn Habitat.

BIGHORN HISTORIC HABITAT: Habitat that was occupied by bighorn sheep within recent historic times (since the advent of white settlers), with potential for reoccupation through habitat development or management.

BROWSE: Leaves, twigs or shoots of shrubs, trees, or woody vines available as forage for domestic and wild browsing animals.

CALF CROP: The number of calves weaned per number of cows bred, usually expressed in percent.

CARBOHYDRATE RESERVES: Plant foods composed of sugars and starches which are stored in the roots, stems, and seeds.

CARRYING CAPACITY: The maximum stocking rate possible without inducing damage to vegetation or related resources.

CLIMAX: The highest and most stable stage of ecological development of a biotic community capable of perpetuation under the prevailing climatic and soil conditions, when undisturbed by outside forces.

COMPETITION: The general struggle for existence in which the living organisms compete for a limited supply of the necessities of life.

COW-CALF OPERATION: An agricultural enterprise in which economic gains result from production and sale of calves.

CRITICAL GROWTH PERIOD: The period in a plant's growth cycle when food reserves are lowest and grazing is most harmful.

CRUCIAL BIGHORN HABITAT: That habitat within two miles of water needed to sustain bighorn during the critical summer period.

CRUCIAL DESERT TORTOISE HABITAT: That habitat containing tortoise population densities of 50 or more tortoises per square mile, the estimated minimum needed to sustain a viable tortoise population.

CRUCIAL HABITAT: That part of the habitat that is necessary to sustain the existence and/or perpetuation of a wildlife species at critical periods, or is necessary to maintain a healthy wildlife population.

CRUCIAL QUAIL HABITAT: That habitat within 1.5 miles of water needed to sustain quail during the critical summer period when succulent vegetation is unavailable.

CUSTODIAL MANAGEMENT: A level of grazing management of an allotment in which the management objective is to administer grazing in such a way as to avoid further deterioration, including low intensity use supervision focusing on changes in ownership or livestock operations.

DEFERRED GRAZING: Postponement of grazing for a stated period of time.

DESERT TORTOISE CRUCIAL HABITAT: See Crucial Desert Tortoise Habitat.

DESIRABLE FORAGE PLANTS: Species which are palatable and productive, often dominant under climax or near-climax conditions; includes the important key species (grasses, forbs, and browse) which are to be maintained or increased by intensive livestock management.

DETERIORATED RANGE: Range on which present vegetation and soil erosion conditions represent a significant departure from potential.

DISCOUNT RATE: A mathematical factor used to convert future dollars to present dollar values. The discount rate used by the Federal government for fiscal year 1982 is 7.625.

ECOLOGICAL RANGE CONDITION: The present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in the present plant community resemble that of the climax plant community for the site. Range condition is basically an ecological rating of the plant community.

ENDANGERED SPECIES: Any species in danger of extinction throughout all or a significant portion of its range.

EPHEMERAL CLASSIFICATION: The management classification of grazing allotments which are generally located below 3,200 feet in elevation, receive less than 5 inches of precipitation annually, show little or no perennial vegetation, and lack potential for improvement of any perennial vegetation that may exist.

EPHEMERAL FORAGE: Forage consisting of annual plants that appear after precipitation, primarily in the spring and fall.

EPHEMERAL-PERENNIAL: A management classification of grazing allotments which are generally above 3,200 feet in elevation, receive 5 or more inches of precipitation annually, and show both perennial vegetation and potential for improvement of that perennial vegetation.

EROSION: Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

EXCLOSURE: An area fenced to exclude one or more species of animals.

FEEDER OPERATION: See Stocker Operation.

FIXED COSTS: Those expenses, such as mortgage payments, that continue unchanged without regard to the level of production (e.g., number of cattle).

FORAGE: All browse and herbaceous foods that are available to grazing animals.

FORB: A non-grass seed-producing plant that does not develop persistent woody tissue.

FOREGONE INTEREST: This term applies to the ranch budgets developed by the ESCS and refers to the revenue that could be earned if the funds invested in land and equipment were instead earning an average rate of return in the market place.

GERMINATION: The time plants begin to sprout or begin to grow from seed.

GRAZING PRIVILEGES: Attached to base property, privileges possessed by a permittee or lessee for grazing on public lands.

GRAZING SYSTEM TREATMENT: A prescription, under a grazing system, which grazes or rests a unit of land at particular times each year to attain specific vegetation goals.

GRAZING TRESPASS: The grazing of livestock on public land without proper authority.

GRAZING SYSTEM: A systematic sequence of grazing treatments applied to an allotment to reach identified multiple-use goals or objectives by improving the quality and quantity of the vegetation.

GROUND WATER: The water stored in permeable strata below the earth's surface.

GREEN UP: Beginning of new vegetative growth in the spring.

HABITAT AREA: The area which a wildlife species occupies for a certain time of year.

HERD USE AREA: A geographically defined area of primary wild horse or burro use. An area where horse or burro concentrations have been observed. (See Occasional Use Area.)

INCREASER SPECIES: A plant species that will increase in relative amount under continued overuse.

INTENSIVE MANAGEMENT: A level of grazing management of an allotment in which the management objective is to improve current range condition and productivity; variable (up to high) use supervision and monitoring would be conducted, focusing on evaluation of the effectiveness of actions taken to achieve the objective.

INTERIM MANAGEMENT POLICY (IMP): Management of public lands during the wilderness review process.

INTERMEDIATE FORAGE PLANTS: Species of secondary importance in the climax condition. They replace the desirable species as condition deteriorates, and replace the undesirable species as condition improves. They may be less palatable to grazing animals or be more resistant to grazing use.

INVADER: Plant species that were absent or present in very small amounts in undisturbed portions of the original vegetation of a specific range site and will invade following disturbance or continued overuse.

KEY AREA: A portion of range, which, because of its location, grazing, or browsing value and/or use, serves as an indicative sample of range conditions, trend, or degree of use and guides the management of the entire area of which it is a part.

KEY MANAGEMENT SPECIES: Those species which must, because of their importance, be considered in the management program.

KINDS OF LIVESTOCK: Species of domestic livestock, i.e., cattle, horses, or sheep, or a combination of these. May be broken down to greater detail such as cows with calves, yearlings, steers, ewes with lambs, etc.

LICENSED USE: Active use AUMs that a permittee has paid for during a given grazing period.

LITTER: A surface layer of loose organic debris consisting of freshly fallen or slightly decomposed organic material.

LIVESTOCK FORAGE CONDITION: An interpretation of the quality of forage of each vegetation type for the class of livestock authorized to graze on an allotment. Three condition classes are used to express quality of forage condition: Good - 40 percent or more of the vegetation composition consists of desirable and intermediate forage plants, with at least 15 percent being desirable, and the soil surface factor is less than 60; Fair - 15 to 39 percent of the vegetation composition consists of desirable and intermediate forage plants, with at least 5 percent being desirable, and the soil surface factor is less than 60; Poor - less than 15 percent of the vegetation composition is made up of desirable and intermediate forage species, less than 5 percent is desirable, or the soil surface factor is greater than 60.

LIVESTOCK SUPPORT FACILITIES: A structure, action, or practice that facilitates management of the range or the livestock grazing on it.

LONG TERM: A point in time 35 years following the final implementation of land use decisions.

MAINTENANCE MANAGEMENT: A level of grazing management of an allotment in which the management objective is to maintain or improve the current balanced used and satisfactory range condition and productivity. Low intensity use supervision and monitoring would focus on changes in ownership or livestock operations.

MANAGEMENT FRAMEWORK PLAN (MFP): Land use plan for a specific planning area. It sets goals, objectives, and constraints to guide the development of detailed plans for the management of each resource.

MITIGATION: Measures taken to minimize or eliminate adverse impacts.

MIGRATION: The seasonal movement of a species from one habitat area to another.

MULTIPLE USE: The management of public lands and their various resource values so that they are utilized in a combination that will best meet the present and future needs of the public.

NONUSE: An authorization to refrain, temporarily, from placing livestock on public ranges without loss of privileges for future considerations.

OCCASIONAL USE AREA: Those areas adjacent to wild horse and burro herd use areas where horse or burro sign is evident, but actual observation of animals has not been made.

PALATABILITY: The attractiveness of a plant to animals as forage.

PASTURE: Grazing area of various sizes enclosed and separated from other areas by fence or natural barrier.

PERENNIAL PLANTS: A plant that has a life cycle of three or more years.

PERIODS-OF-USE (DOMESTIC ANIMALS): The time of year when domestic animals would be allowed on a specific unit of range, as designated by a grazing authorization.

PERMITTEE: One who holds a permit to graze livestock on public lands.

PHENOLOGY: The study of periodic biological phenomena such as flowering, seed production, etc., as related to climate.

PLANT VIGOR: The state of health of a plant. The capacity of a plant to respond to growing conditions, to make and store food, and to complete the reproductive stages.

PLAYA: The shallow central basin of a desert plain in which water gathers after a rain and is evaporated.

POTENTIALLY SUITABLE: Range which is presently unsuitable for livestock grazing, but which has the potential to become suitable through management and range improvements.

PROPER USE: The percentage of the current year's production during a specific period of the year that animals may graze a plant without harming the vegetation.

PROPER USE FACTOR: The percentage of use that can be made of a forage species under proper management. Used in the calculation of range inventories.

PUBLIC LANDS: Lands administered by the Secretary of the Interior through the Bureau of Land Management.

QUAIL CRUCIAL HABITAT: See Crucial Quail Habitat.

RANCH BUDGET: An itemized summary of the expenditures and receipts of a ranch operation.

RANCH WEALTH: The value of a ranch in a given market, at a given time.

RANGE IMPROVEMENT: A structure, development, or treatment used to rehabilitate, protect, or improve the public lands to advance range betterment.

RANGE SITE: A distinctive kind of rangeland that differs from other kinds in its ability to produce a characteristic natural plant community.

RANGE STUDIES: Appraisal of range land to determine range condition and trend.

RANGE SURVEY (VEGETATION INVENTORY): A method for the measuring of vegetation production to provide base data for establishing the grazing capacity used in making management decisions.

RARE SPECIES: Designated by the State of Nevada, this is a wildlife species that, although not presently threatened with extinction, is in such small numbers throughout its range that it may be endangered if its environment worsens.

REASONABLE NUMBERS: Long-term average big game population cooperatively agreed upon by the BLM and the Nevada Department of Wildlife.

RECRUITMENT RATE: The net annual increase in an animal population.

RIPARIAN: A biological zone influenced by the presence of water. Also used to refer to vegetation that grows along streams or around springs.

SEED-RIPE: A phenological phase in the reproductive stage of a plant at which time seed is mature.

SEED TRAMPLING: Trampling of disseminated seed into the soil mantle by livestock, wild horses and burros, and wildlife.

SENSITIVE PLANTS: Species not yet officially listed but which are undergoing a status review or are proposed for listing according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce, or according to comparable State documents published by State officials.

SENSITIVE SPECIES: A wildlife species that is designated jointly by the Nevada State Director of BLM in cooperation with the Director of the Nevada Department of Wildlife to recognize those species that clearly merit special attention in BLM planning and decision-making processes.

SHORT TERM: A point in time five years following the initial implementation of the grazing decision.

SPRING DEVELOPMENT: A permanent structure on a naturally occurring surface water source providing potable water for livestock, wild horses and burros, and wildlife.

STOCKER OPERATION: A type of livestock operation where weaned calves or yearlings are bought in the spring or early summer, fattened on private or public range, and sold in the summer or fall. There is generally little or no year-round cow herd.

SUITABILITY: Physical and/or biological character of an area that makes grazing the area feasible.

SUITABILITY CRITERIA: Standards used to determine the suitability for grazing. These include steepness of slope, distance from water, and vegetative production.

SUITABLE RANGE: Forage-producing land which can be grazed on a sustained yield basis under an attainable management system without damage to the basic vegetation and soil resource of the specific or adjacent areas.

THREATENED SPECIES: Any species likely to become endangered within the foreseeable future throughout all cr a significant part of its range.

THRESHOLD: A threshold is a maximum or minimum number, or other parameter, established by somebody or something that will be affected by the impact. It may be an individual or interest group, or it may be a tolerance within the ecosystem itself. The threshold is set according to a particular point of view (value system).

THRESHOLD LEVELS: May be specific defined levels of resource use, production, or development which are established as maximum or minimum constraints for determining significance. Threshold levels may be established to ensure that the analysis identifies an unacceptable level of cumulative impacts.

THRESHOLD ANALYSIS: This is the process of comparing possible threshold levels to anticipated cumulative impacts and establishing that point where an additional increment in the threshold will make a major change in impact.

TREND (RANGE): The direction of change in range condition over a period of time.

UNDERSTORY: Plants growing beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or brush canopy.

UNDESIRABLE FORAGE PLANTS: Definitely the poorer species in a type of community, these plants consist primarily of invader, noxious, and low value forage plants.

UNIT RESOURCE ANALYSIS (URA): A comprehensive display of physical resource data and an analysis of the current use, production, condition, and trend of the resource and the potentials and opportunities within a planning unit, including a profile of ecological values.

UTILIZATION: The portion of the current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole.

VARIABLE COSTS: Those expenses that fluctuate with the amount of production, e.g., feed for cattle.

VEGETATION: Plants in general, or the sum total of the plant life above and below ground in an area.

VEGETATION ALLOCATION: The apportionment of available vegetation to livestock, big game, wild horses, burros, and other resources.

VEGETATION COMMUNITY: A plant community with distinguishable characteristics.

VEGETATION COMPOSITION: Percentage of each plant species present within a vegetation type.

VEGETATION COVER: The surface area of land occupied by vegetation; usually important in terms of the density of plants within the vegetation cover.

VEGETATION MANIPULATION: Alteration of vegetation by fire, mechanical, chemical, or biological means to meet management objectives.

WATERSHED: A total area of land above a given point on a waterway, that contributes runoff water to the flow at that point.

YEARLING: An animal approximately one year of age. A short yearling is from 9 to 12 months of age and a long yearling is from 12 to 18 months.

ACRONYMS

AF - Acre-Foot
AGM - Annual Geometric Mean
AMP - Allotment Management Plan
AUM - Animal Unit Month
BLM - Bureau of Land Management
CRMP - Coordinated Resource Management and Planning
EIS - Environmental Impact Statement
ES - Environmental Statement
FLPMA - Federal Land Policy and Management Act
HMAP - Herd Management Area Plan
HMP - Habitat Management Plan
MFP - Management Framework Plan
NDW - Nevada Department of Wildlife
NPS - National Park Service
NRA - National Recreation Area
PL - Public Law
PRIA - Public Rangeland Improvement Act
SCS - Soil Conservation Service
URA - Unit Resource Analysis
USDA - U.S. Department of Agriculture
USDI - U.S. Department of the Interior
WSA - Wilderness Study Area

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